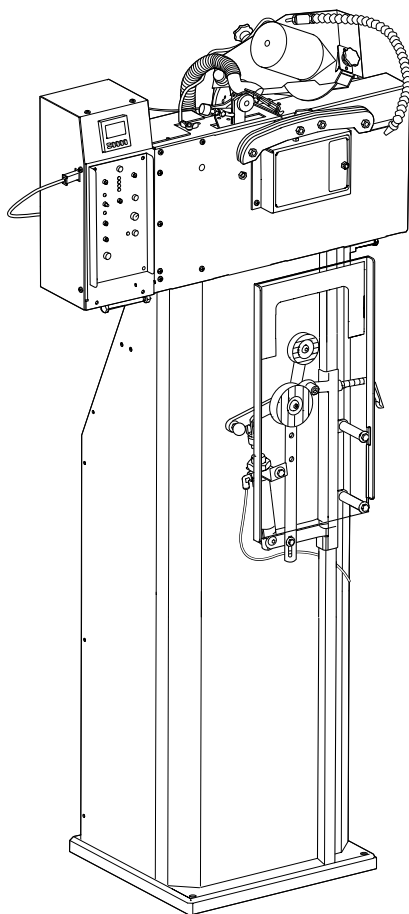




MARKUSSON

PROFESSIONAL GRINDERS



Original Instruction Manual Sensomatic

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1 Introduction

1.1 Important user information

⚠ WARNING Before you install, operate or do maintenance on the machine, you must read the safety information in this manual. Obey the instructions in this manual to prevent injuries or damage to the equipment.

1.2 About this manual

This user manual describes how to safely install, operate, and perform basic maintenance on the Sensomatic Auto Chain Grinder chain sharpening machine. This manual also describes the parts of the machine, and it shows different accessories and spare parts that are available.

1.3 Intended use

The machine must only be used to sharpen the cutting chains used on power saws, forestry machines and harvesters. It automatically sharpens the cutting teeth, gullets and depth gauges on chains. The machine is designed for indoor use only.

Unintended use

The machine must not be used outdoors or in a manner that is not described in this manual.

1.4 Regulatory information

Regulations are given below. A copy of the EC Declaration of conformity is supplied with the machine.

⚠ WARNING Before you install, operate or do maintenance on the machine, you must read the safety information in this manual. Obey the instructions in this manual to prevent injuries or damage to the equipment.

Directive/standard	Description
2006/42/EC	The Machinery Directive (MD)
2014/35/EU	The Low-Voltage Directive (LVD)
2014/30/EU	The Electro Magnetic Compatibility Directive (EMC)
EN-ISO:12100:2010	Safety of machinery - Basic components, general principles for design
EN 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 61000-6-3:2007	Emission standard for residential, commercial and light-industrial environments
EN 55014-1:2017, EN 55014-2: 2015	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission - Part 2: Immunity

1.5 Nameplate

This nameplate is placed on the Sensomatic Auto Chain Grinder's grinding head.



1.6 Recycling information

This symbol shows that electrical and electronic equipment must not be disposed of as unsorted municipal waste. It must be collected separately. Recycle according to current local rules and regulations.



1.7 Contact information

Manufacturer:

Markusson Professional Grinders AB

Tegelbruksvägen 3

SE 762 31 Rimbo

Sweden




Web: www.markusson.se

E-mail: info@markusson.se



















2 Safety

2.1 Safety notices

This section contains safety information for the Sensomatic Auto Chain Grinder. This manual contains WARNINGS, CAUTIONS and IMPORTANT notes that are applicable for the safe operation of the machine.

-  **WARNING** A warning tells you about conditions that can cause injury or death, if you do not obey the instructions. Do not continue until all conditions are accepted and engaged.
-  **CAUTION** A caution tells you about conditions that can cause damage to equipment, if you do not obey the instructions. Do not continue until all conditions are accepted and engaged.
-  **IMPORTANT** Important or noteworthy information that enables trouble-free and optimal use of the machine.

2.2 Safety instructions

-  **WARNING** Before you install, operate or do maintenance on the machine, you must read the safety information in this manual. Obey the instructions in this manual to prevent injuries or damage to the equipment.
-  **WARNING** Put the machine indoors, in a dry area with good light and a flat and level floor. Do not let the machine become wet or moist. Do not put the machine near gas, liquids or other materials that can catch fire or explode.
-  **WARNING** Do not operate machines in explosive atmospheres, such as in the presence of flammable liquids, gases or dust, or near flammable materials. Machines create sparks which may ignite such materials.
-  **WARNING** The user must only do maintenance that is described in this manual on the machine. Only approved and trained service technicians can do service on the machine.
-  **WARNING** Make sure that the power is turned off before you install, operate or do maintenance on the machine.
-  **WARNING** To prevent mistakes when chains are sharpened, it is very important to understand how the grinding machine works. Read the instructions carefully before the machine is used.
-  **WARNING** Use protective glasses – risk of sparks from the machine when grinding.
-  **WARNING** Use ear protection – risk of hearing damage.
-  **WARNING** Use safety gloves – risk of cuts from the grinding disc or chain.
-  **WARNING** Be careful around moving parts – risk of squeezing.
-  **WARNING** Stop the machine immediately if it does not work correctly!
-  **WARNING** Before a chain is sharpened, make sure that the grinding disc is not cracked, does not vibrate or wobble. If the grinding disc is damaged it must be replaced immediately, see chapter 6.3. "Change the grinding disc and fit the grinding disc guard". If abnormal vibrations occur during operation, immediately stop the machine and check the condition of the grinding disc.
-  **WARNING** Attach air hoses and cables with cable clamps, to make sure no one trips over them.
-  **WARNING** The Sensomatic machine must always be safely attached to the stand. Attach the stand to the floor.
-  **CAUTION** Only use accessories that are supplied or approved by the manufacturer.
-  **CAUTION** If the pitch is not correctly set the chain will be pushed into an incorrect sharpening position. This may result in a damaged chain.
-  **CAUTION** If the metal of a cutting link turns blue during grinding, the speed is set too high and the metal is overheated. This can cause the metal in the cutting tooth to lose its properties. Replace the damaged cutting link or sharpen the chain again.
-  **CAUTION** Clean the machine daily. To prevent that it breaks, remove grinding dust every day. Use a vacuum cleaner, brush or similar to clean the machine.

2.3 Signs and symbols

See the table below for information about the signs and symbols on The Sensomatic Auto Chain Grinder:

Sign/Symbol	Description
	Warning! A warning tells you about conditions that can cause injury or death, if you do not obey the instructions. Do not continue until all conditions are accepted and engaged.
	Risk for cutting injuries. Keep fingers away from the area when the machine is on.
	Risk for pinching injuries. Keep fingers away from the area when the machine is on.
	Before you install, operate or do maintenance on the machine, you must read the safety information in the User manual. Obey the instructions to prevent injuries or damage to the equipment.
	Always wear protective gloves when using the machine.
	Always wear protective glasses and ear protection when using the machine.
	Pictogram showing the parts of the tooth that are grinded with the 3 in 1 function.
	Pictogram showing tooth adjustment. Turn knob counterclockwise to move the left tooth forward and the right tooth backward. Turn knob clockwise to move the left tooth backward and the right tooth forward.

3 Product Description

3.1 Product overview

The Sensomatic Auto Chain Grinder is a machine that sharpens chains. The machine can sharpen chains (up to .404" pitch) for power saws, forestry machines, and harvesters. A pneumatic chain tensioner is attached to the stand. It works with both short and long chains and secures and tensions the chain when it is sharpened. The stand has 2 chain hangers, which makes it easier to separate the sharpened chains from chains that are not yet sharpened.

The machine has 2 grinding modes:

- The regular grinding mode where only the cutters are sharpened.
- The 3in1 grinding mode where all 3 edges (the cutting teeth, the gullet and the depth gauge) on the cutters are sharpened. The edges are sharpened, one after the other, without interaction from the user.

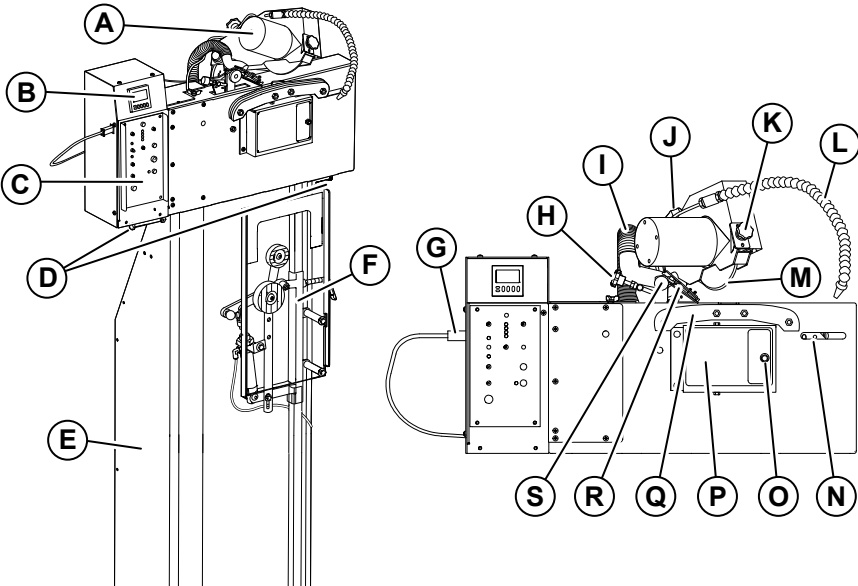
The machine has 2 chain pusher modes:

- The standard mode, used for sharpening of standard chains.
- The skip tooth mode, used for sharpening 3/8" pitch skip sequence chains.

The machine has a sensor system:

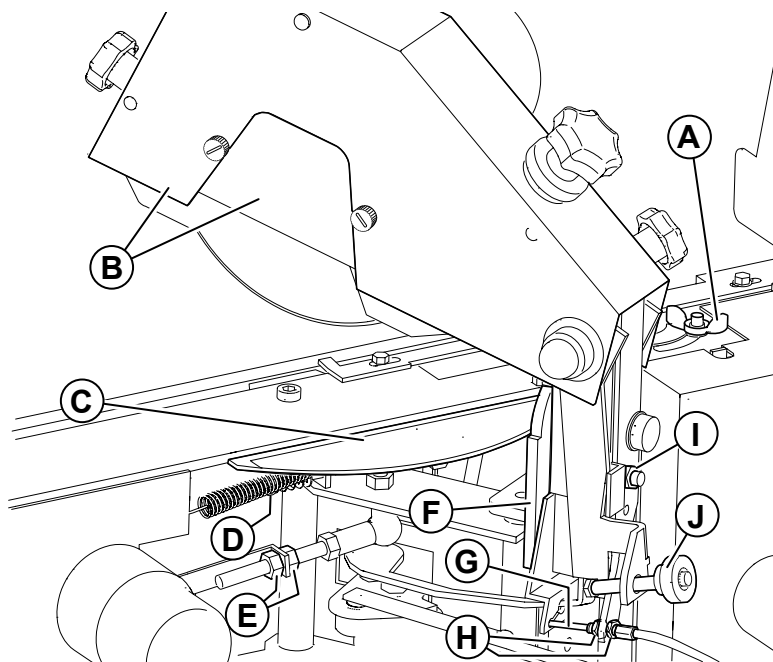
- The sensor detects if the next cutter is a right cutter or a left cutter. The grinding head is moved to the correct position to grind the cutter, without interaction from the user. The sensor also detects if there are double tie straps or a broken cutter, and indicates an error.

3.2 Front view



Pos	Part	Description
A	Grinding head	Holds the grinding wheel in its correct position.
B	Counter	Sets the number of cutters to be sharpened. See section 3.6.1, "Counter".
C	Control panel	The controls starts and stops the different functions of the machine. See section 3.6, "Controls" for further information.
D	Chain hangers	Hangers on both sides for unsharpened or sharpened chains.
E	Stand	Holds the machine.
F	Pneumatic chain tensioner	Secures the chain in the correct position.
G	Power supply cable	Supplies electricity to the machine.
H	Chain pusher adjustment knob	Sets the grinding length.
I	Exhaust pipe	Collects dust and metal chips produced during grinding.
J	Grinding depth knob	Sets the grinding depth for the gullets.
K	Grinding wheel centering knob	Centers the grinding wheel above the chain.
L	Air cooling kit	Cools the chain during sharpening.
M	Grinding wheel	The wheel that sharpens the chain.
N	Top-plate angle screw	Sets the top-plate angle, 0-35°. Default 30°.
O	Left-right alignment screw	Sets the right and left cutters to equal length.
P	3 in 1 pictogram	Shows how the 3 in 1 function works.
Q	Chain vise	Positions the chain as it moves in the machine.
R	Sensor	Detects if the next cutter is a right cutter or a left cutter.
S	Chain pusher	Advances the chain through the vise.

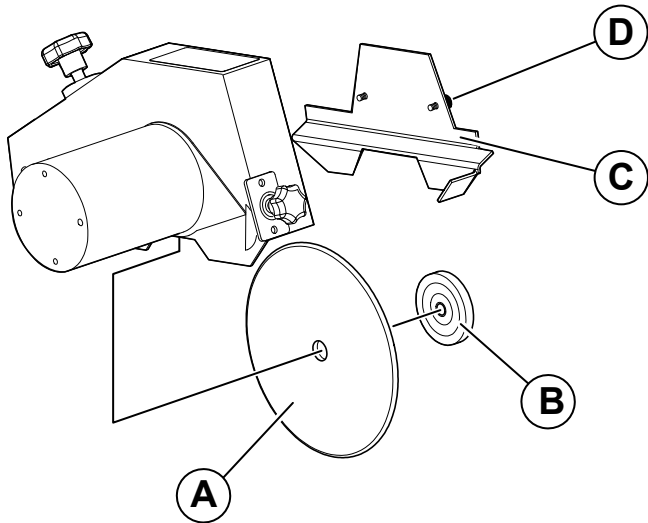
3.3 Back view



Pos	Part	Description
A	Pitch adjustment wing	Makes an approximate setting for the pitch.
B	Grinding head cover and grinding wheel guard	Protects the grinding head and grinding wheel; it also protects the user from sparks during grinding.
C	Top-plate angle scale	Shows the top-plate angle on a scale from 0-35°. Default: 30°. It is set using the top-plate angle screw (N in Front view illustration).
D	Chain lock adjustment screw	Adjusts the width of the groove in the chain vise when the chain vise is in the LOCKED position.
E	Top plate angle adjustment screw	Sets the top plate angle equal left to right.
F	Head-tilt angle scale	Shows the head-tilt angle on a scale from 50-70°. Default: 60°.
G	Wire	Controls the vertical movement of the grinding head.
H	Wire adjustment knobs	Adjusts the wire that controls the vertical movement of the grinding head.
I	Head-tilt angle nut	Sets the head-tilt angle on the head-tilt angle scale. (F)
J	Depth gauge height knob	Sets the height of the depth gauge.

3.4 Grinding head

The grinding wheel on the grinding head sharpens the chains. The type of wheel, the top-plate angles, the settings of the grinding head, and the profiling of the grinding wheel all determine how the chain is sharpened.

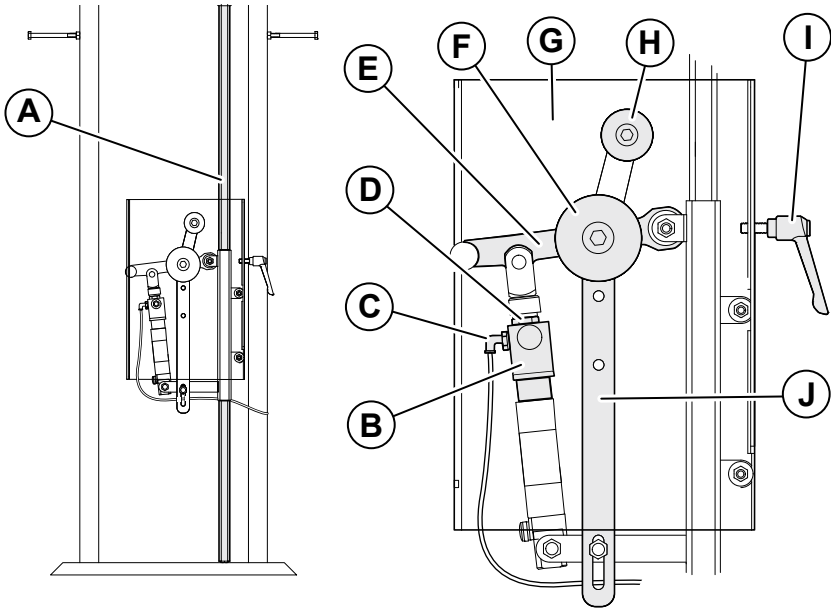


Pos	Part	Description
A	Grinding wheel	Grinds the chain.
B	Grinding wheel nut	Keeps the grinding wheel in place.
C	Grinding wheel guard	Protects the user and grinding wheel when the chain is sharpened.
D	Attachment knobs	Keep the grinding wheel guard in place.

3.5 Pneumatic chain tensioner

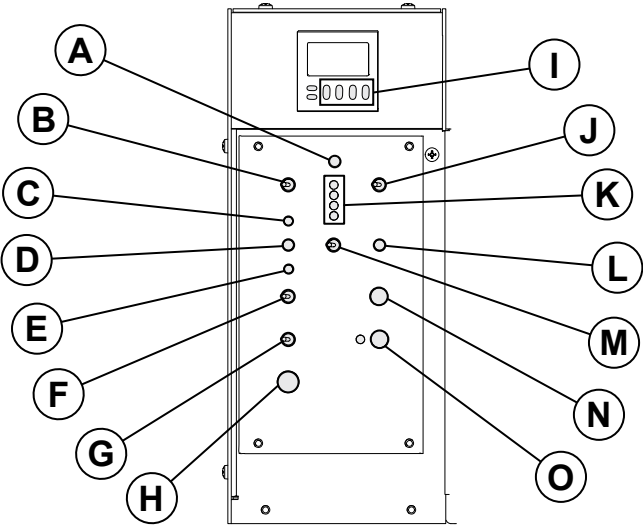
The purpose of the pneumatic chain tensioner is to attach and secure the chain in the correct operating position. It also keeps the chain properly tensioned during grinding. The chain tensioner has two tensioner rolls for different chain lengths.

Note: You can also order a telescopic chain extension kit if you need to fit longer chains. See section 8, “Accessories and Spare Parts”.



Pos	Part	Description
A	Chain tensioner rod	Where the tensioner slides up and down. The tensioner is moved to fit chains of different lengths.
B	Pneumatic piston	Gives flexibility to the tensioner.
C	Air hose	Supplies the tensioner with pneumatic air.
D	Pneumatic piston nut	Holds the pneumatic piston in place.
E	Tensioner arm/Quick release	Allows the user to tension or release the chain faster than if the locking handle is used (quick release function).
F	Lower tensioner roll	Allows the chain to move when it is sharpened. For long chains.
G	Protection cover	Protects the user from pinch injuries.
H	Upper tensioner roll	Allows the chain to move when it is sharpened. For short chains.
I	Locking handle	Locks the tensioner in place.
J	Guide rod	Guides the upper tensioner roll.

3.6 Controls



Pos	Part	Description
A	Reset button	Resets the counter.
B	Chain pusher switch	ON: starts the chain feed, so that the chain moves in a forward direction. OFF: stops the chain feed.
C	Sensor indicator	Indicates that the sensor is ON.
D	Sensor reset	Resets the sensor (after error indication).
E	Sensor error indicator	Indicates a problem with the sensor, or indicates if the sensor detects double tie straps or a broken cutter.
F	Depth gauge grinding speed switch	Toggles between low and high speed for depth gauge grinding.
G	3 in 1 switch	ON: all 3 edges (the cutters, the gullet and the depth gauge) on the chain are sharpened. OFF: only the cutters are sharpened.
H	Stop button	Shuts off the power and stops the machine. The stop button is used to turn off the machine after operation and to do an emergency shut-down.
I	Counter digit buttons	Sets the digits in the counter.
J	Grinding wheel motor switch	Starts the grinding motor.
K	Troubleshooting indicators	Indicates potential problems with the machine. See section 7.4, "Troubleshooting indicators".
L	Grinding head positioning button	Changes the angle of the grinding head from left to right, or vice versa. Can only be used when the sensor is OFF.
M	Sensor switch	Turns the sensor ON or OFF.
N	Grinding speed knob	Sets the grinding speed.
O	Power button	Turns on the machine.

3.6.1 Counter

The counter consists of a display and buttons that set the number of cutters to be sharpened. Before you start the machine, use the buttons to program the number of cutting teeth to be sharpened. The machine will automatically stop after the programmed number of cutting teeth have been sharpened.

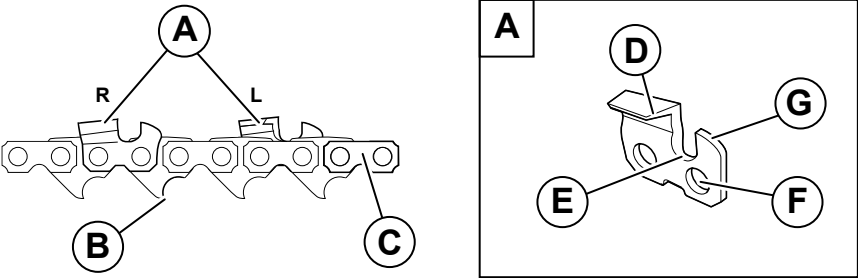
- The lower digits on the display show how many cutting teeth that will be sharpened before the machine automatically stops. The first digit button (1) sets the first digit (1xxx-9xxx), the second button sets the second digit (x1xx-x9xx), etc. The counter can be set to count up to 9999 sharpened cutting teeth. The number of cutting teeth set will be stored in the memory until the next time the number is set.
- The upper digits show the number of cutting teeth that are already sharpened. This number increases by 1 for every cutting tooth that is sharpened. This counter can be reset by using the "reset" button.

3.6.2 Grinding speed knob

The grinding speed knob sets the speed of the grinding wheel. The speed can be set to different speeds to grind 0 to 4 mm (0" to 5/32") off the cutting teeth.

3.7 Chain overview

This section describes the definitions for the parts of a normal chain.



Pos	Part	Description
A	Cutters	R: Right cutter. L: Left cutter.
B	Drive link	The lower part of a link. Used to push the chain forward in the chainsaw, etc.
C	Tie strap	The links separating the cutters.
D	Cutting tooth	The part of the cutter that cuts chain.
E	Gullet	The space between the cutting tooth and the depth gauge.
F	Rivet hole	A hole where the rivet is placed.
G	Depth gauge	The front part of the cutter.

3.8 Technical data

Parameter	Value
Supply voltage	12-15 V DC
Power	144 W
Current	12 A
Over-current protection	Automatic fuse type ptc
Rotation speed, grinding wheel	3250 rpm
Peripheral speed, grinding wheel	25 m/s
Dimensions, grinding wheel (for the grinding wheels included in the delivery)	Outer diameter (OD) x Width (W) x Inner diameter (ID): <ul style="list-style-type: none">• 150 mm x 3.2 mm x 16 mm (5 7/8" x 1/8" x 5/8")• 150 mm x 4.8 mm x 16 mm (5 7/8" x 3/16" x 5/8")
Max dimensions for the Sensomatic Auto Chain Grinder	Length (L) x Width (W) x Height (H): 480 mm x 330 mm x 520 mm (18.9" x 12.9" x 20.4")
Dimensions, stand	Length (L) x Width (W) x Height (H): 345 mm x 360 mm x 1070 mm (13.5" x 14.1" x 42.1")
Weight of the machine	20.3 kg
Weight, stand including converter	33 kg
Compressed air supply pressure	0.5–0.8 MPa (5–8 bar, 73–116 psi)
Sound power level L_{w_A} (working)	92 dB(A)
Sound pressure level L_{p_A} (working)	79 dB(A)

4 Installation



4.1 Safety during installation

⚠ WARNING Before you install, operate or do maintenance on the machine, you must read the safety information in this manual. Obey the instructions in this manual to prevent injuries or damage to the equipment.

⚠ WARNING Always wear safety gloves, protective glasses, and any other personal protective equipment suitable for the current work task.

4.2 Site requirements

⚠ WARNING Put the machine indoors, in a dry area with good light and a flat and level floor. Do not let the machine become wet or moist. Do not put the machine near gas, liquids or other materials that can catch fire or explode.

⚠ WARNING The Sensomatic machine must always be safely attached to the stand. Attach the stand to the floor.

Note: Machines can be set up on a bench or you can use the included stand. Please note that mounting hardware for the bench is not supplied with the machine.

4.3 Unpack the machine

Note: For a video demonstration of how to unpack, assemble, install, and operate the machine, visit Markusson.se

1. Unpack the crates.

Note: Keep the delivery crates and packing materials. Pack the machine in them if it is moved or sent for service. The crates and packing materials will minimize the risk of damage during transportation.

2. Make sure that all parts in the list below are included in the delivery:

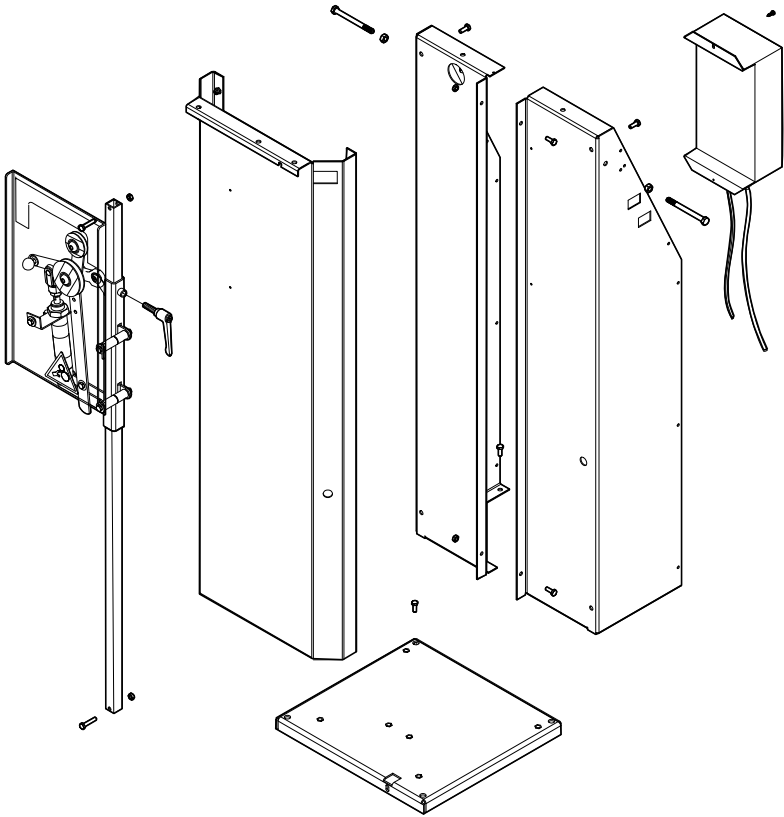
- Sensomatic Auto Chain Grinder machine
- stand (with set of screws, nuts and bolts for assembly)
- pneumatic tensioner, air tubes, and 2 nipples for different types of compressors
- converter (with 2 screws for assembly)
- Sensomatic Auto Chain Grinder User manual (this document)
- rectangular profile stone (55 x 15 x 15 mm), profile template and transport lock (used as protection during transport and fitted in the chain vise)
- toolkit with:
 - hex key, which is used to change the top-plate angle
 - Allen wrench, which is used for tightening
 - feeler gauge (0.05 mm) which is used for adjusting the wire
- grinding wheel guard (mounted)
- 2 types of ceramic grinding wheels,
- screws, nuts and bolts for assembly




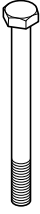








Note: For your convenience, you may also use your own tools to assist the machine's assembly.

3. Remove all packing materials. Leave only the cable ties and the transportation lock that holds the grinding head in place. Remove the air hose connector's packing material.

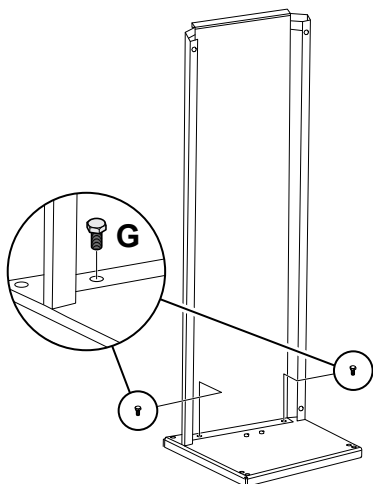
4.4 Assemble the stand

⚠ CAUTION The Sensomatic machine must always be safely attached to the stand. Attach the stand the floor.
To mount the grinder on the stand, begin by assembling the stand. The stand comes in 4 pieces: two sides, one base and one front piece.

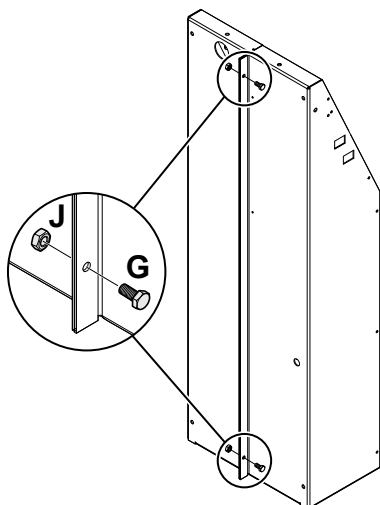


- | | | | | | | | |
|---|---|---|---|---|---|--|---|
| A | B | C | D | E | F | G | H |
|  |  |  |  | 
2x | 
3x | 
12x | 
4x |
| 2x | 1x | 1x | 2x | I | J | K | L |
| | | | | 
2x | 
7x | 
3x | 
2x |

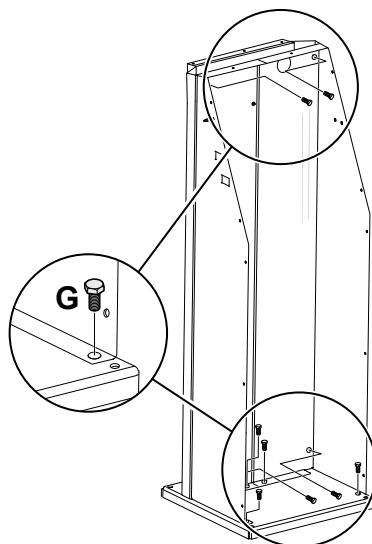
1. Start by placing the base piece on the floor. Place the front piece on top of the base piece by aligning the holes they have on the front right and left corners. Bolt the front piece to the base through the two holes using the provided wrench.



2. Next, attach the two side pieces to each other with provided bolts through the holes at the intersection of two pieces to create the side support piece.



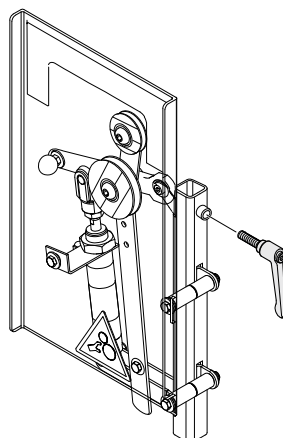
3. To complete the assembly of the stand, bolt the side support first to the base and then to the front piece.



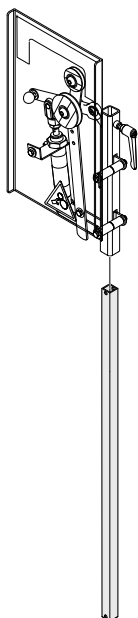
4.5 Assemble the pneumatic chain tensioner

To assemble the pneumatic chain tensioner, lay the stand on the floor with the front piece facing up.

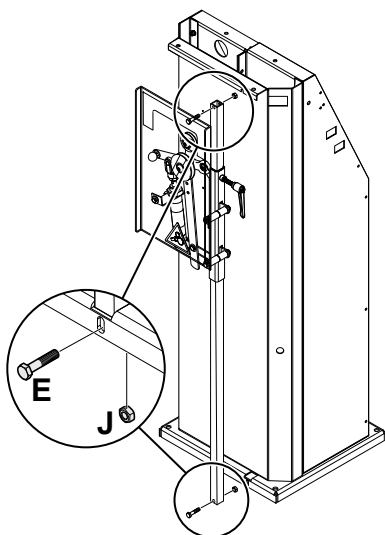
1. First, attach the handle to the pneumatic chain tensioner.



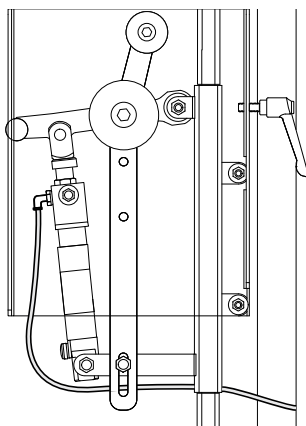
2. Then insert the rod through the unit and insert the bottom part of the rod onto the base of the stand.



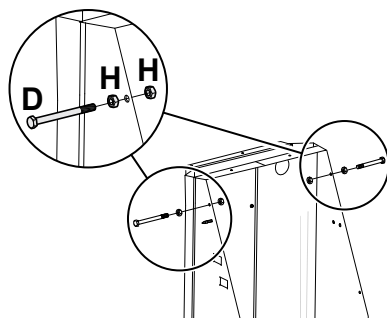
3. To secure the rod, start from the top. Place the provided nut on the top of the hole and insert the bolt from the bottom of the rod towards the top, and then through the nut.



4. Do not completely tighten the bolt. Once the bolt is in place, slide it into the slot located at the top part of the stand, then tighten the bolt.
5. Once the top portion is secured, use the second set of nuts and bolts to fix the bottom part of the rod to the stand. After securing both the bottom and the top, bring the stand back to an upright position.
6. There are two air lines to be attached to the pneumatic chain tensioner: one with an air fitting attached to the end and one without a fitting.
7. Insert the line without the fitting on the left side of the stand, bringing it from back to front. Route the line through the back of the rod and insert it into the pneumatic tensioner until it sits in place.



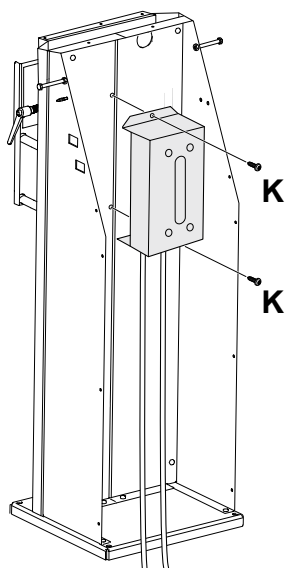
8. Now attach the chain holders that will allow you to keep loops of chain up off of the ground. Insert the provided long bolts into the holes located on both sides of the stand and fix them in place with a 13 mm (0.5") wrench.



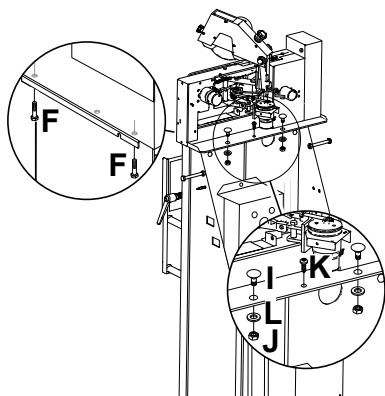
9. The stand will need to be secured on the floor through the holes located at the base of the stand.

Note: The bolts are not provided with the machine.

10. After the stand is assembled and secured, bolt the AC/DC converter to the back of the stand by aligning the two holes located at the top and the bottom of the converter to the holes on the stand.



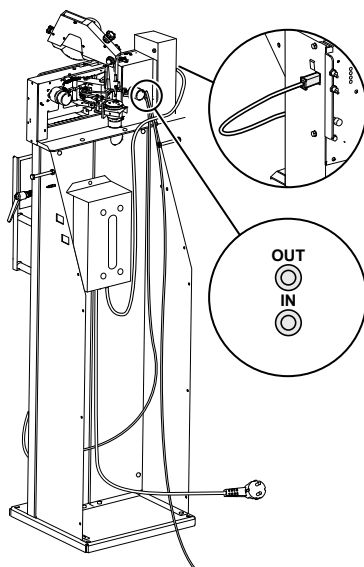
11. Next, place the machine on the stand. Fix it to the stand through the 3 holes located at the back of the machine with the bolts and nuts provided.



12. To connect the AC/DC converter unit to the machine, plug in the black and red power cable into the control panel through the slot on the left hand side of the machine.

Note: For best performance, use the converter provided by Markusson.

13. To connect the air unit, slip the air line that has been attached to the pneumatic chain tensioner into the slot marked as "out" at the back of the machine. Then insert the second airline into the slot marked "in". Next, connect the line with the fitting unit to an air compressor with a pressure range of 0.5–0.8 MPa (5–8 bar).



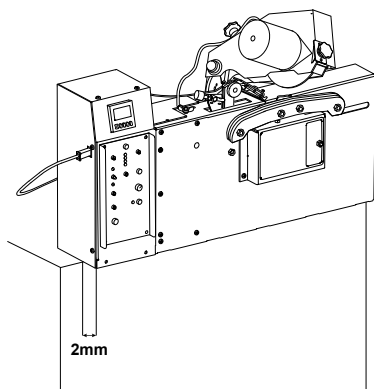
⚠ WARNING Attach air hoses and cables with cable clamps to make sure no one trips over them.

4.6 Bench-mount the machine

An alternative to having the grinder on a stand is to bench-mount the machine.

Bench-mounting offers you flexibility and the ability to sharpen chains virtually anywhere using the electrical from any wall outlet or use of a 12V power source.

⚠ WARNING Put the power converter where there is as little dust as possible and out of reach of sparks from the machine.



If the machines are not being used with the stand and the pneumatic tensioner, it should be used with the weight tensioner in order to provide the chain with the tension needed for grinding. The weight tensioner is available separately for purchase (see section 8, "Accessories and Spare Parts").

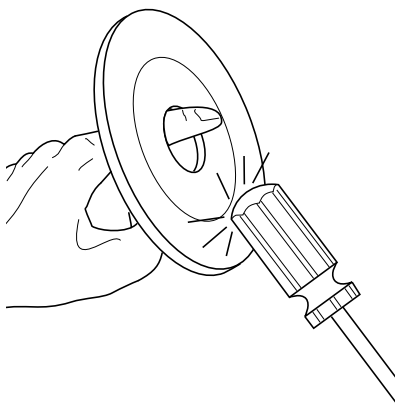
4.7 Install and center the grinding wheel

The first step in preparing the grinder for use is installing and centering the appropriate grinding wheel.

The grinder comes with 2 wheel sizes: 3.2 mm (1/8") and 5 mm (3/16"). These wheels are 150 mm (5 7/8") in diameter with 16 mm (5/8") arbor size. It is critical to select the wheel of the appropriate thickness for each chain.

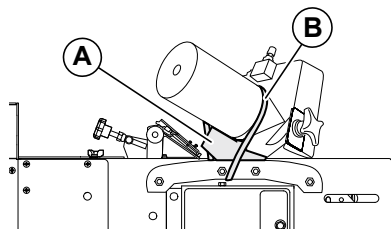
The correct wheel size for a particular Markussen saw chain can be found in several sources: this manual, the back of the Markussen chain packaging, Markussen Maintenance and Safety Manual, or online at Markussen.se

⚠ WARNING Inspect the grinding wheel and make sure that it is not cracked or damaged. There is a simple test (called the "ring test") that you can do to check for damage to a grinding wheel. Hold the grinding wheel up by its center hole. Knock the edge of the grinding wheel gently with a non-metallic object (like the plastic handle of a screwdriver). If the grinding wheel makes a dull, non-metallic noise, then the wheel could be damaged. **DO NOT USE IT. CRACKED GRINDING WHEELS MUST BE REPLACED IMMEDIATELY.** See also section 6.3, "Change the grinding wheel and fit the grinding wheel guard".

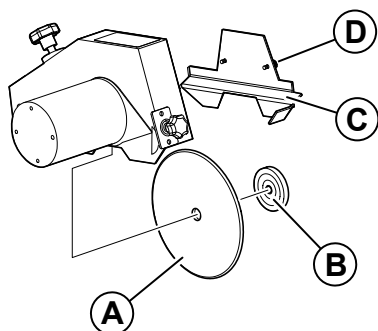


Once the grinding wheel has been verified, you're ready to begin the install.

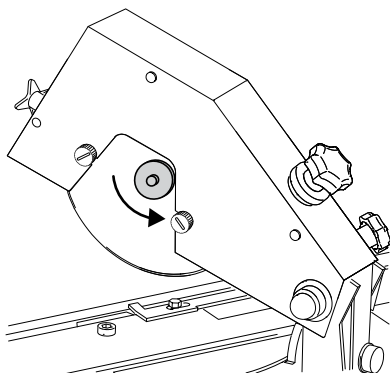
1. Remove the transportation lock (A) and the cable ties (B) that hold the grinding head in place.



2. Remove the grinding wheel guard (C) to access the wheel attachment nut (B). Turn the two attachment knobs (D) to remove the guard.



3. Remove the wheel attachment nut from the hub.



4. Next, insert the appropriate wheel onto the hub and, using moderate pressure with your hands, secure the wheel attachment nut to hold the wheel in place.

⚠ WARNING Over-tightening the wheel can cause it to break.

5. Finally, reposition the guard and secure it in place with the knobs.

⚠ WARNING Never start the grinder without the wheel guards in place.

6. Before using the grinder, you'll need to check to ensure the wheel is properly installed.
7. With the power off, gently spin the grinding wheel and check for wheel wobble.
8. Conduct a final check for proper assembly by turning on the main power and switching on the wheel power switch while standing to the side. Look for vibrations due to wheel oscillation or other interference.

⚠ WARNING Always keep bystanders at a safe distance from a grinder while in operation.

Note: To get the best performance from your grinder, ensure the grinding wheel is centered over the vise. Refer to this user manual or the provided video for specific instructions.

4.8 Test the machine before first use

1. Make sure that all packing materials are removed.
2. Make sure that the air hoses and wires are correctly connected.
3. Make sure that the machine is securely fastened to the stand.
4. Make sure that the machine is on a level surface; if the machine wobbles, or if the surface is not level, attach the stand to the floor with screws.
5. Perform a sharpening test on the machine to ensure it functions correctly. See section 7.2, "Sharpening test".

5 Operation



5.1 Safety during operation

⚠ WARNING Before you install, operate or do maintenance on the machine, you must read the safety information in this manual. Obey the instructions in this manual to prevent injuries or damage to the equipment.

⚠ WARNING Always wear safety gloves, protective glasses, ear protection, and any other personal protective equipment suitable for the current work task.

⚠ WARNING The grinding disc can fall down on your hand and cause injuries. Keep fingers away.

⚠ WARNING To prevent mistakes when chains are sharpened, it is very important to understand how the grinding machine works. Read the instructions carefully before the machine is used.

⚠ WARNING The chain can be sharp. Use safety gloves when handling chains.

5.2 Prepare for operation

Note: For a video demonstration of how to install and operate the machine, go to Markusson.se.

5.2.1 Prepare the grinding wheel

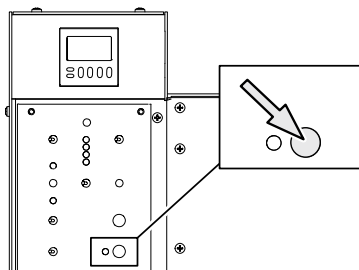
⚠ WARNING Before a chain is sharpened, make sure that the grinding wheel is not cracked, does not vibrate or wobble. Perform a "ring test"; see section 4.7, "Install and center the grinding wheel" If the grinding wheel is damaged, it must be replaced immediately; see section 6.3, "Change the grinding wheel and fit the grinding wheel guard".

If abnormal vibrations occur during operation, immediately stop the machine and check the condition of the grinding wheel. Make sure all the switches are turned off before turning the power back on.

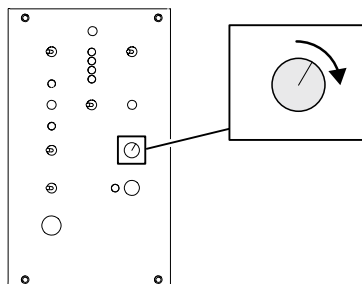
Note: Before each chain is sharpened, make sure the grinding wheel edges match the shape of the chain type.

The condition, type and profile of the grinding wheel is essential for the machine's accurate operation. The instructions that follow contain information on how to make sure that the grinding wheel is in good condition and has the correct profile.

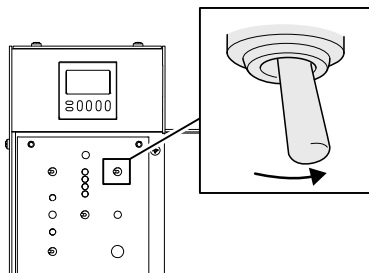
1. Press the power button to turn on the machine.



2. Set the grinding speed knob to low speed.

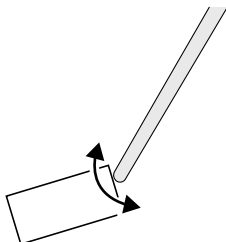


3. Set the grinding wheel switch to ON.

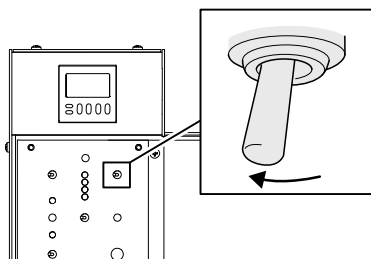


4. Make sure that the grinding wheel does not vibrate or wobble. If the grinding wheel is damaged, it must be replaced immediately; see 6.3, "Change the grinding wheel and fit the grinding wheel guard".

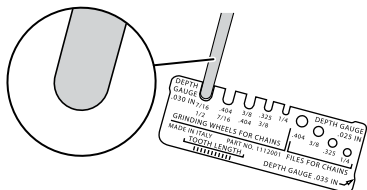
5. Make sure the grinding wheel edges match the shape of the chain type.
 - For Ceramic grinding wheels: Use the profile stone (included in delivery) to shape the edges on the grinding wheel. Use a light-sweeping action to shape the edges of the wheel. Use the provided template to verify proper radius shape for the specific grinding wheel being used.



6. Set the grinding wheel switch to OFF.



7. Use the profile template to verify that the grinding wheel has the same profile as the type of chain to be sharpened.

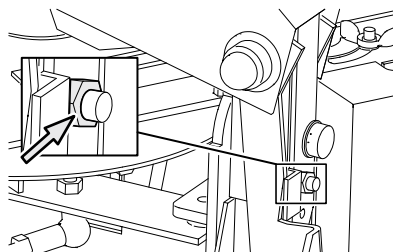


8. Repeat steps 4-8 until the grinding wheel profile is the same as the selected profile on the profile template.

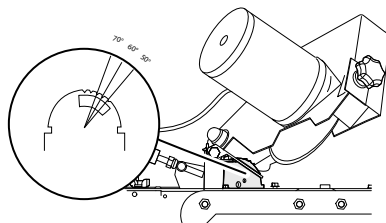
5.2.2 Set the head-tilt angle

Note: Read the specifications from the chain manufacturer to find out the recommended head-tilt angle for your chain.

1. Use an adjustable wrench to loosen the head-tilt angle nut located on the back of the machine.



2. Turn the grinding head to set the desired head-tilt angle (50-70°) on the head-tilt angle scale. The default head-tilt angle is 60°.

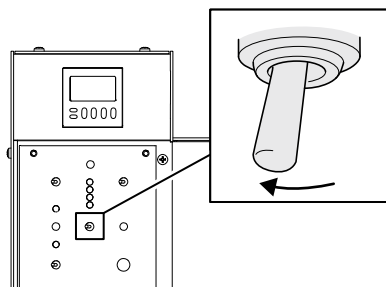


3. Tighten the head-tilt angle nut.

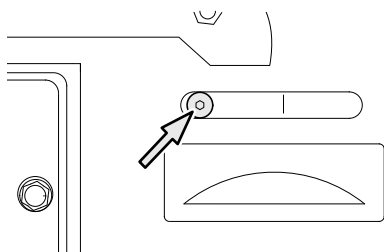
5.2.3 Set the top-plate angle

Note: Read the specifications from the chain manufacturer to find out the recommended top-plate angle for your chain.

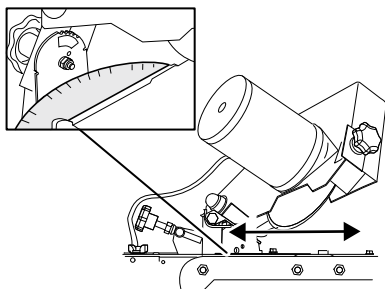
1. Set the sensor switch to OFF.



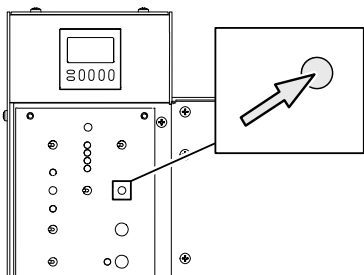
2. Use the hex key (provided with the machine) to loosen the top-plate angle screw up to three turns.



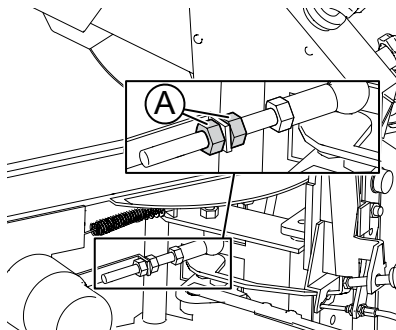
3. Turn the grinding head to set the desired top-plate angle (0-35°) on the top-plate angle scale. The default top-plate angle is 30°.



4. Tighten the top-plate angle screw.
5. Press the grinding head positioning button to move the grinding head in both directions and make sure that the top-plate angles are the same.



6. If the top-plate angles are not the same (for example 26° in the right direction and 30° in the left direction), adjust the nuts (A) a 1/2-turn at the time.

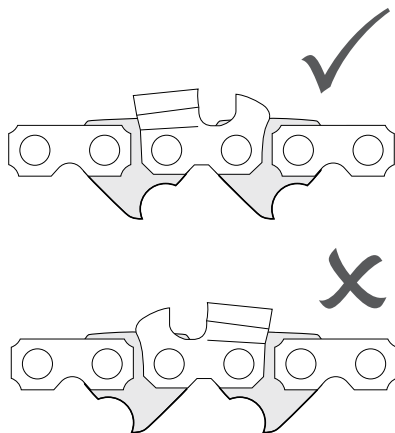


7. Repeat steps 2-5 until the top-plate angles are the same in both directions.

5.2.4 Insert the chain

⚠ CAUTION Always wear safety gloves, protective glasses, and any other personal protective equipment suitable for the current work task.

1. Check the chain for double cutters (2 left cutters or 2 right cutters) or double tie straps, and make sure that the chain is not damaged. Mark double cutters or double tie straps to make it easier to see them when the chain is sharpened.
2. Place the chain, with the cutter to the left of the depth gauge, into the groove on the chain vise.

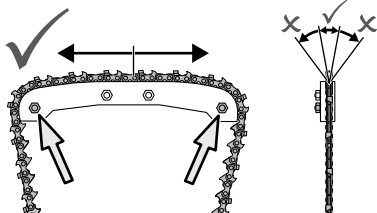


3. Pull the chain around by hand to make sure that it runs freely in the chain vise and does not wobble.

⚠ CAUTION! If the chain does not run freely, or if the chain is forced down into the groove by pressure from the air tensioner, it can get caught during the feed.

Adjust the groove width with the adjustment bolts. The groove must be the same width as the drive link, or 0.2 mm wider.

- a) Use the adjustment bolts to adjust the width of the groove. Tighten the nuts until the chain is fixed, then loosen them about 1/2 turn.

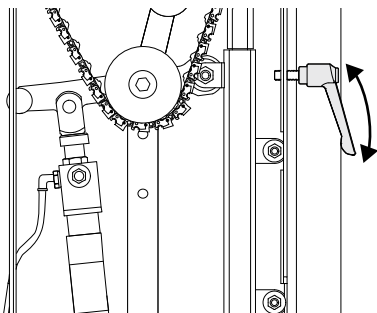


- b) Check manually that the chain moves freely in the vise, and that the vise is not too wide. If necessary, repeat step a).

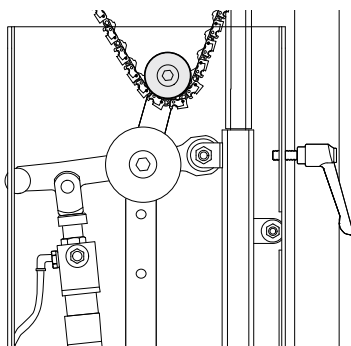
5.2.5 Tighten the chain

Use the upper tensioner roll for short chains.
Use the lower tensioner roll for long chains.

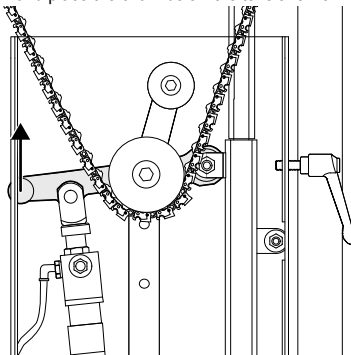
1. Loosen the locking handle and move the tensioner upward or downward to make enough room to position the chain.



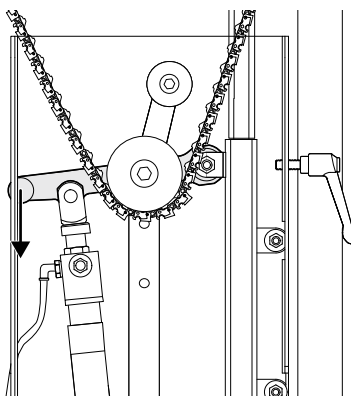
2. When using the upper tensioner roll, place the chain below the tensioner roll.



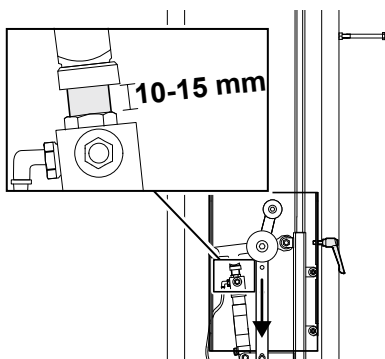
3. When using the lower tensioner roll, lift the tensioner arm (there is a quick release function) and place the chain below the tensioner roll.



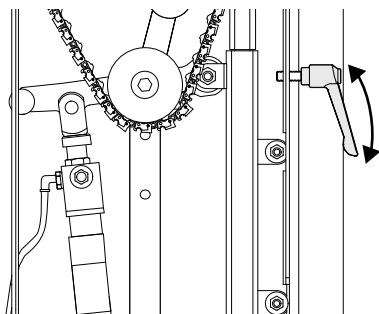
4. Lower the tensioner arm to its bottom position.



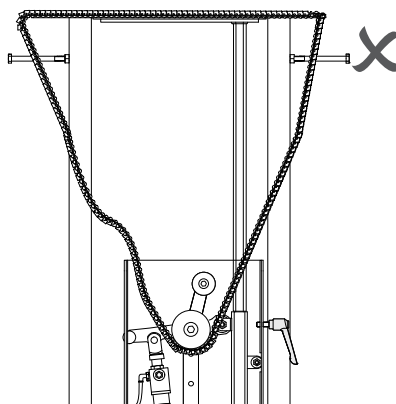
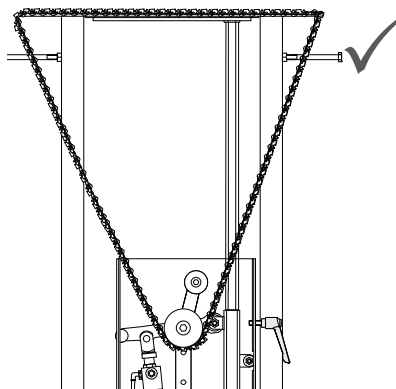
5. Move the tensioner downward until the chain is tightly secured in its position. There should be a gap of about 10–15 mm between the pneumatic-piston nut and pneumatic piston, where the piston should be visible.



6. Tighten the locking handle to secure the chain.



7. Gently press the chain with your hand to test the tension. The chain should not slacken.

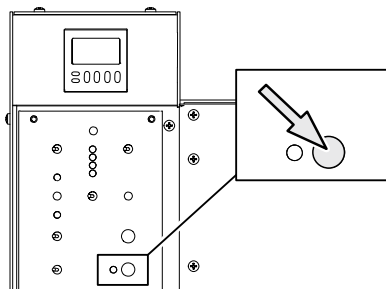


8. If the chain tension is too loose, repeat the procedure.

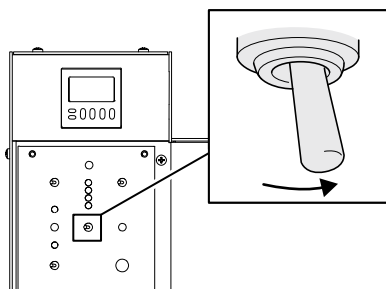
Note: You can also order a telescopic chain extension kit if you need to fit longer chains. See section 8, "Accessories and Spare Parts".

5.2.6 Set the chain pusher

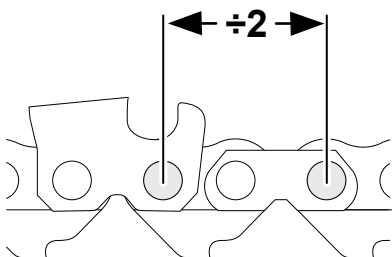
1. Press the power button to turn on the machine.



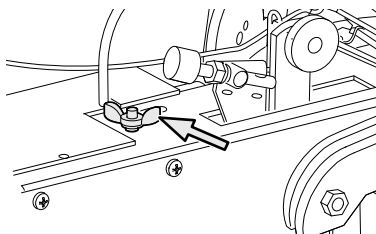
2. Set the sensor switch to ON.



3. Lift the grinding head to its uppermost position.
4. Read the specifications from the chain manufacturer to find the pitch for the chain that is to be sharpened. If you don't know the correct pitch, calculate it by measuring the distance in inches between 3 rivets, and divide it by 2.

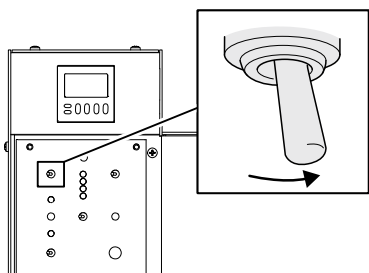


5. Loosen the chain pitch wing-nut and move it to the correct pitch position. Tighten it again.

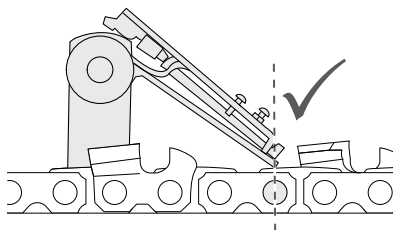


Note: Adjusting the pitch is not the same thing as adjusting the cutting tooth length (see section 5.2.9, "Set the cutter top plate to equal lengths").

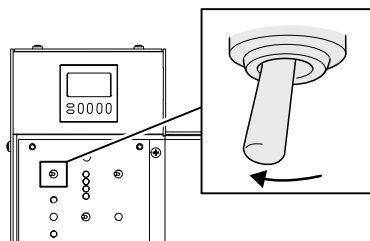
6. Set the chain pusher switch to ON. The chain pusher arm now advances the chain forward.



7. Visually make sure that the chain pusher stops its movement exactly above the rivet behind the cutting link, as illustrated in the image below.

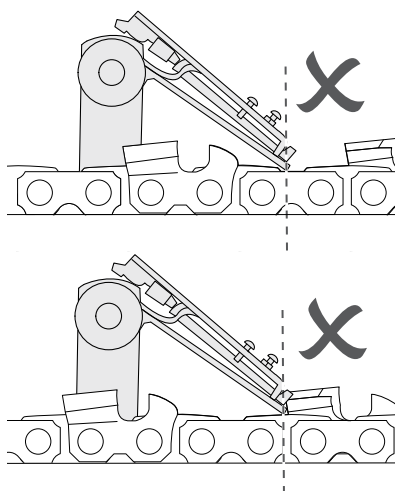


8. Set the chain pusher switch to OFF, when the grinding head is in its uppermost position and the chain lock is not engaged.



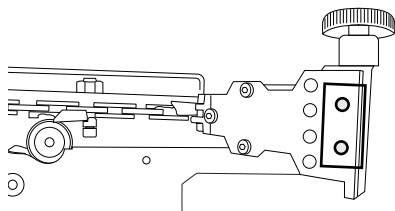
9. Repeat steps 5-9 until the chain pusher stops in the correct position.

CAUTION If the pitch is not correctly set, the chain will be pushed into an incorrect sharpening position. This may result in a damaged chain.

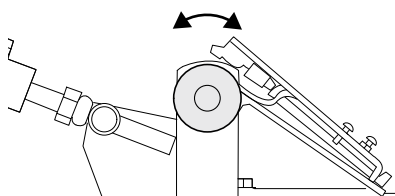


5.2.7 Set the sensor

1. Set the sensor switch to ON. Three lights are turned on: the sensor indicator light next to the switch and two lights on the sensor.

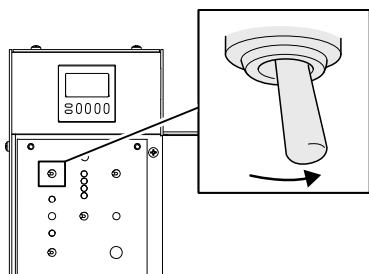


2. Turn the sensor knob to center the sensor over the drive link (see section 3.7, "Chain overview"):

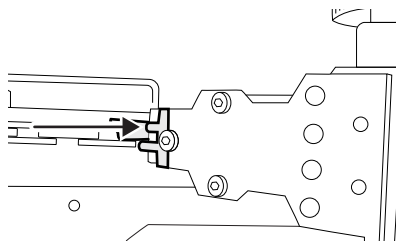


- clockwise, to move the sensor to the left, or
- counter-clockwise, to move the sensor to the right.

3. Set the chain pusher switch to ON. The chain pusher arm now advances the chain forward.



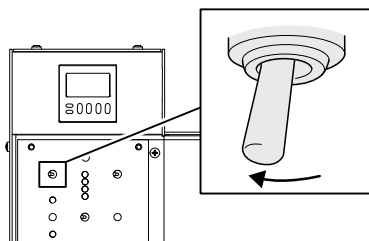
4. Visually make sure that the left sensor finger is pushed in by left cutters and that the right sensor finger is pushed in by right cutters.



5. Also, visually make sure that the sensor fingers are released when the cutters move forward and no longer push the fingers in. If the fingers are not released, see section 7.3, "Issues".

Note: When a sensor finger is pushed in, the corresponding light is turned off. When the finger is released, the light turns on again.

6. Set the chain pusher switch to OFF when the grinding head is in its uppermost position and the chain lock is not engaged.

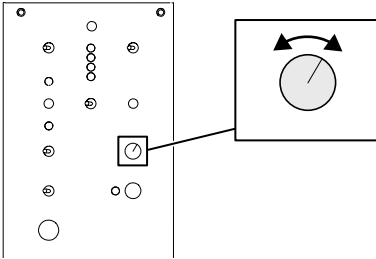


7. Repeat steps 2-6 until both sensor fingers are pushed in by the corresponding cutter.

5.2.8 Set the grinding depth

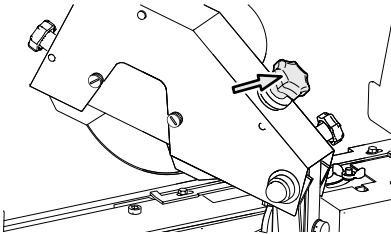
Use a low speed setting when you want to remove a large amount of material, and a high speed setting when you want to remove a small amount of material.

1. Turn the grinding speed knob to set the desired speed for the machine.

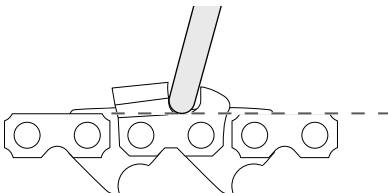


IMPORTANT If the metal of a cutter turns blue during grinding, the speed is set too high and the metal is overheated. This can cause the metal in the cutter to lose its properties. Replace the damaged cutter or re-sharpen the chain.

2. Fold the grinding head down to its grinding position.
3. The grinding depth for gullets is recommended by the chain manufacturer. To set it, turn the grinding depth knob, located on the back of the grinding head:



- clockwise, to grind shallower into the gullet, or
- counter-clockwise, to grind deeper into the gullet.



5.2.9 Set the cutter top plate to equal lengths

If the right (outer) and left (inner) cutters are not sharpened to equal lengths, follow these steps:

1. Do a sharpening test on a test chain, according to the instructions in section 7.2, "Sharpening test".
2. Make sure that the right and left cutting teeth are sharpened to equal lengths. Use the template provided with the machine to measure. If they are not equally long, turn the equal cutting teeth knob:
 - clockwise to increase the length of the right cutter and decrease the length of the left cutter, or
 - counter-clockwise to decrease the length of the right cutter and increase the length of the left cutter.
3. Repeat the sharpening test until the cutter top plates are sharpened to equal lengths. See section 3.2, "Front view", position (O), and adjust the grinding wheel according to the pictogram under the chain vise.

5.2.10 Center the grinding disc

The diameter of the grinding wheel decreases when it is used. To maintain the grinding proportions, the grinding wheel position must be changed when:

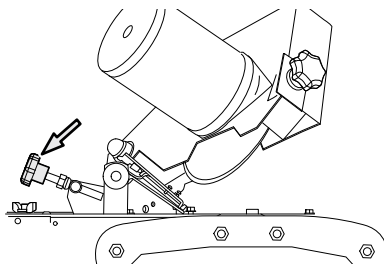
- the grinding wheel has been worn, or
 - the chain has a different pitch that requires a different wheel.
1. Use the grinding wheel centering knob to center the grinding wheel over the chain. The gullets should have equal depth on the left and right cutting links.
 2. Sharpen a few links and then visually inspect the result. If the grinding depth is not equal on the gullets of the right and left cutting links, continue to the next step.
 3. Turn the grinding wheel centering knob to move the grinding motor and the wheel up or down.
 4. Set the arrow on the scale to point to the number that corresponds to the wheel diameter, as displayed below. These scale numbers are approximate and are only for general guidance. Observe if the grinding depth of right and left gullets are equal for final adjustment.

Grinding wheel diameter:	Scale:
150 mm (5.9") (new grinding wheels)	1-3
140 mm (5.5")	3-5
130 mm (5.1")	4-6

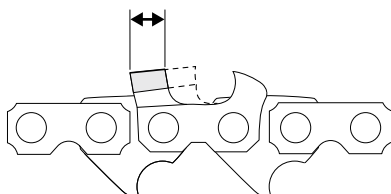
- Repeat steps 1-2 until the grinding depth is equal.

5.2.11 Set the grinding length

- To set the approximate grinding length, turn the chain pusher adjustment knob:



- clockwise, to grind more, resulting in a shorter cutter top plate, or
- counter-clockwise, to grind less, resulting in a longer cutter top plate.

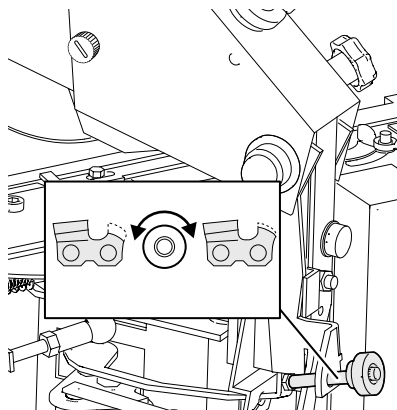


5.2.12 Set the depth gauge height

Change the grinding setting for the height of the depth gauges if required.



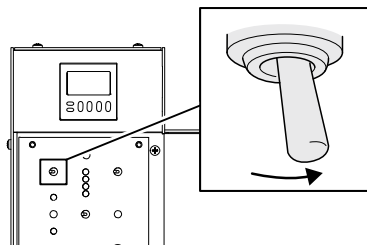
- Do a sharpening test on a test chain, according to the instructions in section 7.2, "Sharpening test".
- Set the depth gauge according to the chain manufacturer's recommendations. See the attached template to make sure that the depth gauge meets the correct specifications.
- Turn the depth gauge height knob to set the remaining depth gauges:



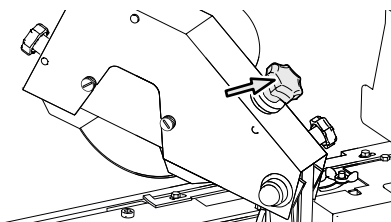
- clockwise to increase the height of the depth gauge (and therefore grind less of it), or
 - counter-clockwise to decrease the height of the depth gauge (and therefore grind more of it).
- Repeat the sharpening test until the height of the depth gauges is correct. Use the template provided with the machine and refer to the top-plate angle chart to determine the correct height.

5.2.13 Test the grinding settings

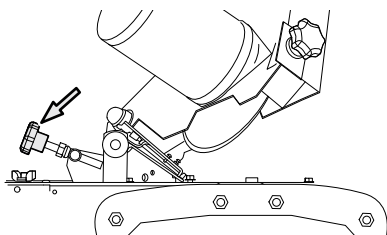
- Set the chain pusher switch to ON. The chain pusher arm will push the chain forward.



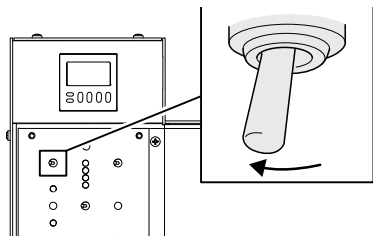
2. Monitor the grinding wheel movements, and check if the chain is sharpened.
3. If required: Turn the grinding depth knob, located on the back of the grinding head, to make minor adjustments for the grinding depth.



4. If required: Turn the chain pusher adjustment to make minor adjustments for the grinding length.



5. Set the chain pusher switch to OFF when the grinding head is in its uppermost position and the chain lock is not engaged.



Important! If the chain has double tie straps, start grinding on the first cutter behind the double-link.

5.2.14 Use skip tooth mode

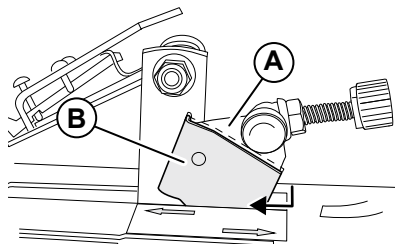
Sensomatic Auto Chain Grinder has 2 chain pusher modes:

- The standard mode, used for sharpening standard chains.
- The skip tooth mode, used for sharpening 3/8" pitch "standard skip sequence chains" that have twice the distance between the cutting teeth.

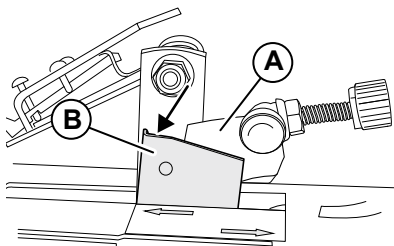
Adjust the chain pusher mode so it accurately sharpens the type of chain you're using.

To set the machine into skip tooth mode:

1. Use a finger or a tool to press plate B away from plate A until it unlocks, and then move it in the direction of the "Skip tooth" arrow.



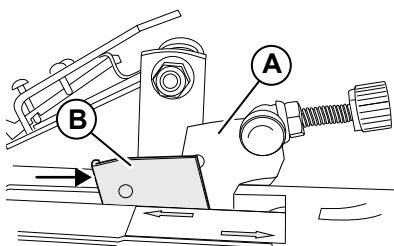
2. Use a finger to press plate B downward and forward into the "Skip tooth" position.



3. Sharpen the chain as instructed in section 5.3, "Operate the machine".

To set the machine back into standard mode:

1. Use a finger to move plate B in the direction of the "Standard" arrow, until it enters its locked position.



2. Sharpen the chain as instructed in section 5.3, "Operate the machine".

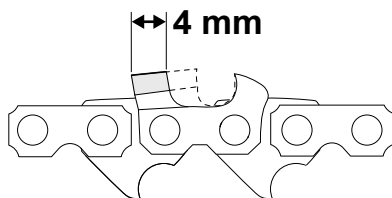
5.3 Operate the machine

⚠ WARNING Always wear safety gloves, protective glasses, ear protection, and any other personal protective equipment suitable for the current work task.

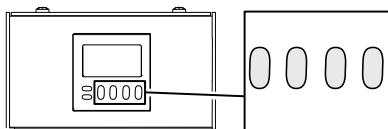
⚠ WARNING Stop the machine immediately if it does not work correctly!

Note: For a video demonstration of how to install and operate the machine, go to Markusson.se.

Note: Discard the chain when the longest part of the cutting tooth is shorter than 4 mm, or if you find cracks or burrs in the chain.



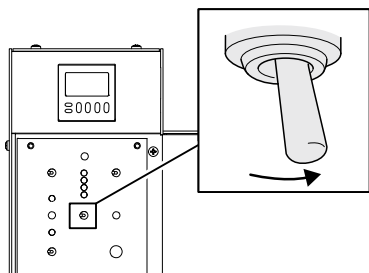
1. Use the first, second and third digit buttons to set the counter to the number of teeth that still need to be sharpened on the chain.



See section 3.6.1, "Counter" for more information about how to set the counter.

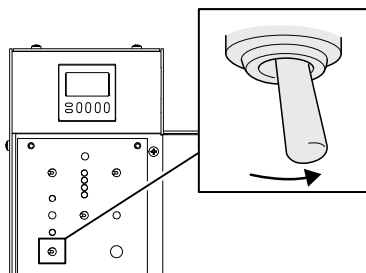
Note: Do not use the 3in1 grinding mode when grinding a brand new chain, e.g. during the first cycle.

2. Set the sensor switch to ON.

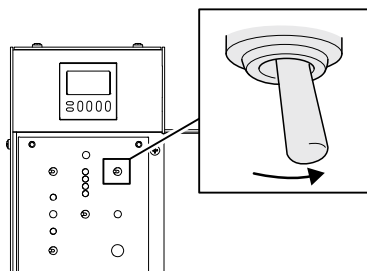


3. Set the 3in1 switch to:

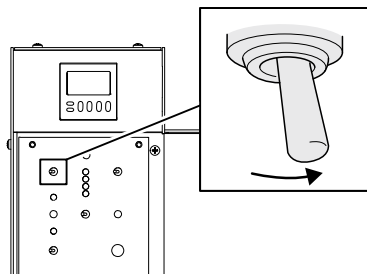
- ON to use the 3in1 grinding mode where all 3 edges (the cutter, the gullet and the depth gauge) on the cutting links are sharpened. The edges are sharpened, one after the other, without interaction from the user.
- OFF to use the regular grinding mode where only the cutters are sharpened.



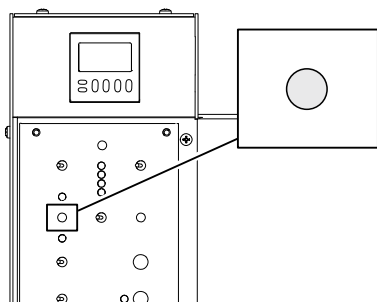
4. Set the grinding wheel switch to ON to start grinding motor.



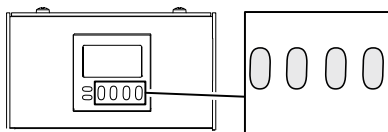
5. Set the chain pusher switch to ON to start the feeding of the chain and the movement of the grinding head. The sharpening will start after this.



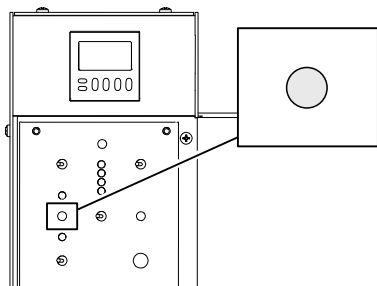
6. Press the reset button when the grinding head moves downward the first time. This resets the counter.



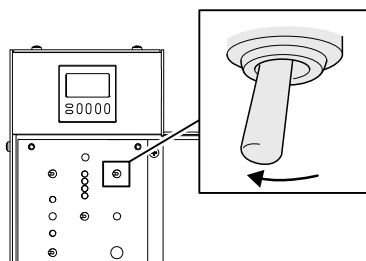
7. Wait until the machine has sharpened the set number of links. When the set number of links are sharpened, the chain feeding and the grinding stops.
8. If required: Use the first, second and third digit buttons to set the counter to the number of cutters that still need to be sharpened on the chain. See section 3.6.1, "Counter" for more information about how to set the Counter.



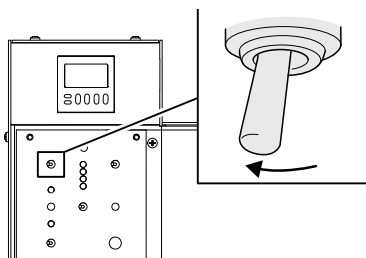
9. If required, press the reset button to reset the counter and start grinding again.



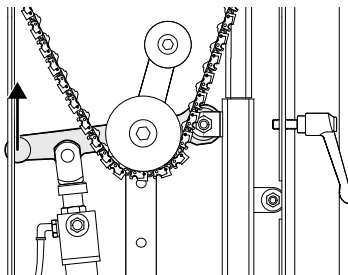
10. Wait until the machine has sharpened the set number of links. When the set number of links are sharpened, the chain feeding and the grinding stops.
11. Lift the grinding head to its most upright position.
12. Set the grinding wheel switch to OFF.



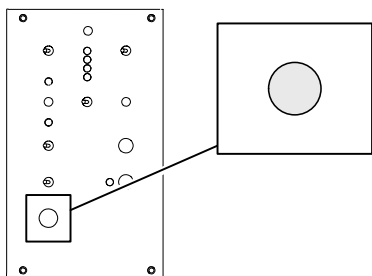
13. Set the chain pusher switch to OFF.



14. Lift the tensioner arm (quick release function) and remove the chain.



15. To turn off the power to the machine, press the stop button.



IMPORTANT Grinding dust can interfere with the machine's operation. Clean the machine daily to remove all of the grinding dust. Use a vacuum cleaner, brush or similar to clean the machine.

5.3.1 Problems during grinding

If double tie straps are encountered, the sensor will stop the machine and indicate an error.

1. Stop the grinding disc and the chain pusher.

⚠ WARNING Make sure the machine has stopped moving before you put your hands into the machine.

2. Feed the chain manually to the next cutter.
3. Start the chain pusher and the grinding disc again.
4. When the cutter is correctly placed, press and hold the sensor reset button until the machine starts again.
5. Resume the grinding.

If a broken cutter is encountered, the sensor will stop the machine and indicate an error. Replace the cutter or discard the chain.

6 Maintenance and Service



6.1 Safety during maintenance

- ⚠ WARNING** Make sure that the power is turned off before you install, operate or perform maintenance on the machine.
- ⚠ WARNING** Before you install, operate or do maintenance on the machine, you must read the safety information in this manual. Obey the instructions in this manual to prevent injuries or damage to the equipment.
- ⚠ WARNING** Always wear safety gloves, protective glasses, and any other personal protective equipment suitable for the current work task.
- ⚠ WARNING** The user must only do maintenance that is described in this manual on the machine. Only approved and trained service technicians can do service on the machine.

6.2 Frequency of maintenance

Maintenance Step	When	Description
Cleaning	Daily	Clean the machine daily to remove grinding dust. Use a vacuum cleaner or brush to clean the machine.
Change grinding wheels.	When worn or damaged.	See section 6.3, "Change the grinding wheel and fit the grinding wheel guard".
Center the grinding wheel.	When worn or if the chain has a different width than the previous.	See section 5.2.10, "Center the grinding disc".
Check and adjust the wire.	Once every 3 months, depending on usage.	See section 6.6, "Check and adjust the wire".
Adjust the chain lock.	When the chain is loose during operation.	See section 6.5, "Adjust the chain lock".

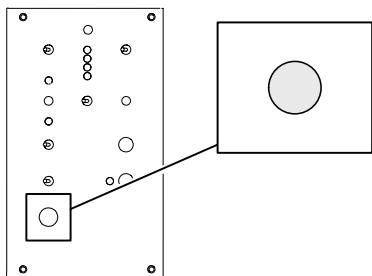
6.3 Change the grinding wheel and fit the grinding wheel guard

⚠ WARNING Before a chain is sharpened, make sure that the grinding wheel is not cracked, does not vibrate or wobble. There is a simple test (called the "ring test") that you can do to check for damage (see section 4.7, "Install and center the grinding wheel").

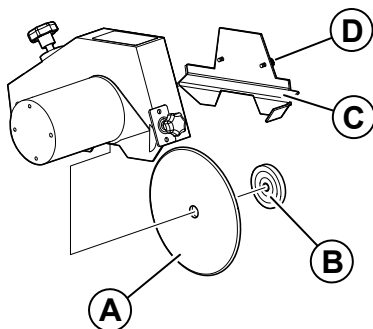
IF THE GRINDING WHEEL IS DAMAGED IT **MUST BE REPLACED IMMEDIATELY**. If abnormal vibrations occur during operation, stop the machine immediately and check the condition of the grinding wheel.

The machine comes with 2 grinding wheels of different sizes. To order more grinding wheels, see 8, "Accessories and Spare Parts".

1. Press the stop button to turn the power off.



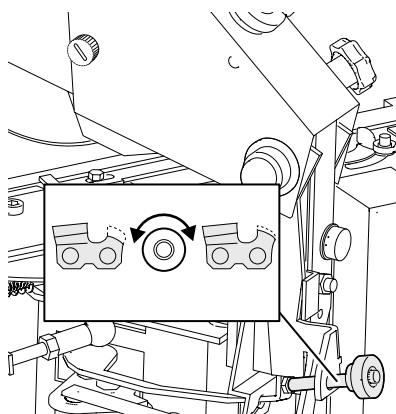
2. Lift the grinding head to its most upright position.
3. If the grinding wheel guard is already attached: Loosen the 2 attachment knobs (D) and remove the guard (C).
4. Hold the grinding wheel and loosen the nut (B).



5. Remove the grinding wheel (A) from the grinding wheel axis and discard it in accordance with local, state and national laws and regulations.
6. Place a new grinding wheel (A) on the grinding wheel axis.
7. Tighten the nut (B) by hand to secure the grinding wheel in its position. Do not over-tighten the nut.
8. Place the grinding wheel guard (C) in its position and fasten the 2 knobs (D).
9. Center the grinding wheel following the instructions in 5.2.10, "Center the grinding disc".

6.4 Set the depth gauge height

1. Do a sharpening test on a test chain, according to the instructions in section 7.2, "Sharpening test".
2. Verify the correct depth gauge setting (refer to the illustration).
3. Turn the depth gauge height knob to set the depth gauge:



- clockwise to increase the height of the depth gauge (and therefore grind less of it), or
 - counter-clockwise to decrease the height of the depth gauge (and therefore grind more of it).
4. Repeat the sharpening test until the height of the depth gauges is correct.

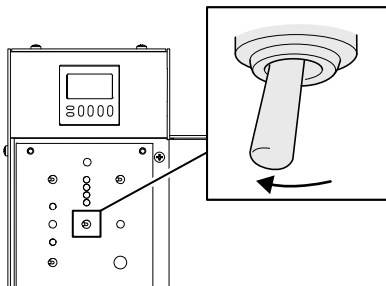
6.5 Adjust the chain lock

NOTE: This instruction is for .404 chain pitch. For other chain pitches, adjust to lower numbers. The chain lock needs to be adjusted if the chain is not fixed during sharpening.

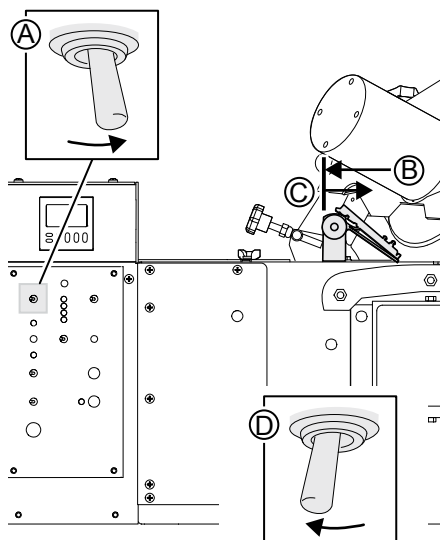
1. Lift the grinding head to its most upright position.

⚠ CAUTION Make sure that the grinding wheel is turned off.

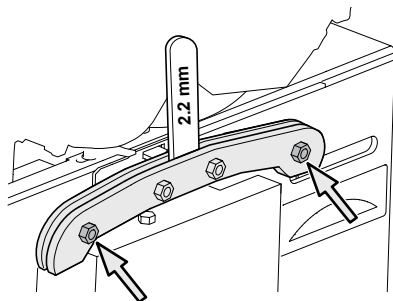
2. Set the sensor switch to OFF.



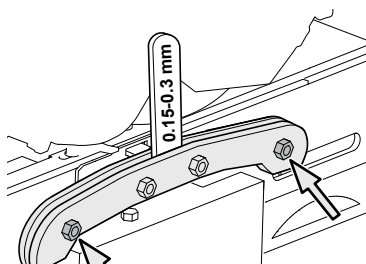
3. Set the chain pusher switch to ON (A). When the chain pusher starts moving forward, the chain vise is in its UNLOCKED position (C). Set the chain pusher switch to OFF (D).



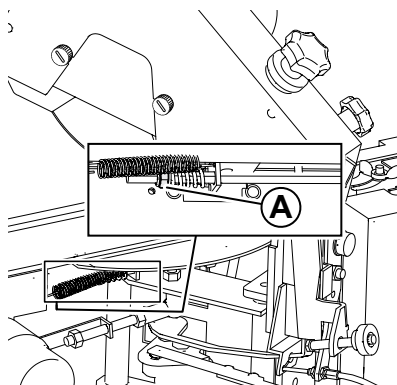
4. Make sure that the groove in the chain vise is approximately 2.2 mm. Insert the feeler gauge. Adjust the nuts if necessary to adjust the chain vise so the feeler gauge can slide out.



5. Set the chain pusher switch to ON (1). When the chain pusher is in its rear position, the chain vise is in its LOCKED position (2). Set the chain pusher switch to OFF (3).
6. Make sure that the groove in the chain vise is between 0.15 and 0.3 mm.



7. If the groove is not between 0.15 and 0.3 mm wide, turn the nut (A) in 1-1.5 turns clockwise, until the groove in the chain vise is between 0.15 and 0.3 mm.

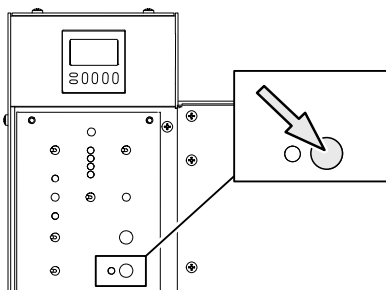


8. Do a sharpening test and make sure that the chain remains in its position during the test. See section 7.2, "Sharpening test".
9. If required: Repeat steps 3-8 until the chain is fixed during sharpening.

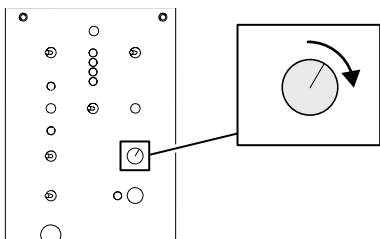
6.6 Check and adjust the wire

Note: If the wire is not correctly set, the grinding machine will not operate correctly. The manufacturer initially sets the wire, but it will become worn during normal machine operations. Always make sure that the wire is set correctly. If necessary, adjust or replace the wire.

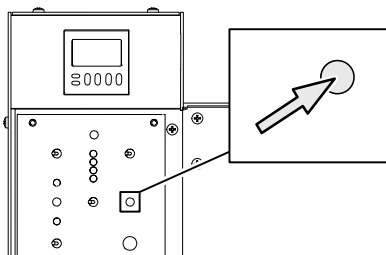
1. Press the power button to turn on the machine.



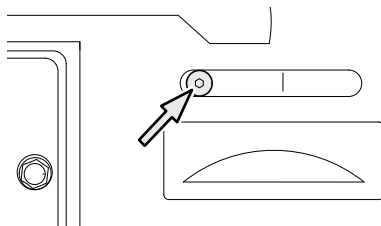
2. Set the grinding speed knob to high speed. See section 3.6.2, "Grinding speed knob".



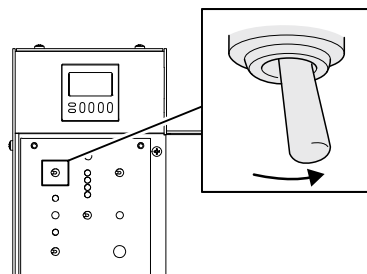
3. Press the grinding head positioning button to turn the grinding head to the left.



4. Set the top-plate angle to 30°. See section 5.2.3, "Set the top-plate angle".

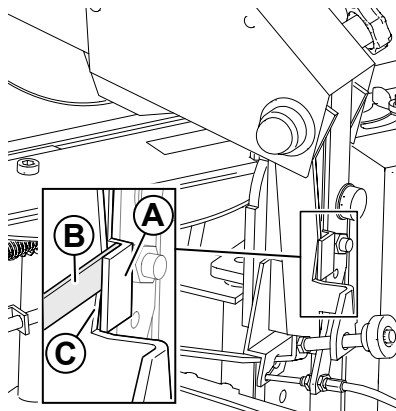


5. Set the chain pusher switch to ON.



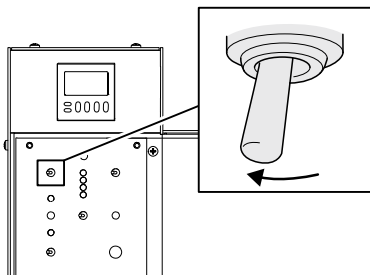
6. Place a 0.05 mm (0.019") feeler gauge (B) between the lifting arm (C) and the flange (A) and make sure that the lifting arm completely meets the flange for about 1.5 seconds before it lifts again.

⚠ IMPORTANT The feeler gauge must sit tightly between the lifting arm and the flange. There must be no gap.

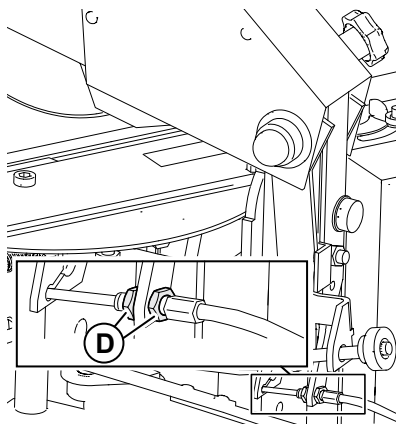


- If the test is successful, the wire does not need to be adjusted. The test is finished.
- If the lifting arm and flange do not completely meet or do not meet long enough, perform the next steps.
- If the wire is damaged or worn, it must be replaced; see section 8.2, "List of accessories". When it has been replaced, repeat steps 1-8.

7. Set the chain pusher switch to OFF.



8. To set the wire so that the lifting arm meets the flange:
 - for a shorter time: turn the 2 nuts (D) in the direction towards the machine.
 - for a longer time: turn the 2 nuts (D) in the direction from the machine.



9. Repeat steps 5-8 until the test is successful.

6.7 Service

⚠ WARNING The user must only do maintenance that is described in this manual on the machine. Only approved and trained service technicians can do service on the machine.

Contact the reseller if the machine needs to be serviced. Pack it in its original packaging for safe shipping.

7 Troubleshooting

7.1 Troubleshooting procedure

1. Make sure that the machine has sufficient power.
2. Read section 7.3, "Issues" and section 7.4, "Troubleshooting indicators" to find a description of the issue.
3. Perform the recommended corrective procedures.
4. Perform a sharpening test, see instruction in section 7.2, "Sharpening test".
5. If the problem persists after corrective procedures, contact your regional sales representative to reach your service team.

7.2 Sharpening test

 **WARNING** Stop the machine immediately if it does not work correctly!

Always do a sharpening test:

- when the machine is new,
- to learn how to use the machine, or
- if the chain is not sharpened as expected.

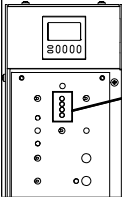
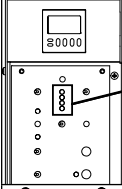
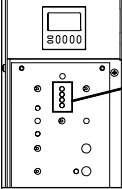
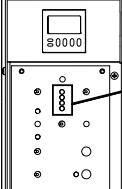
Recommendation: Use an old chain for the test.

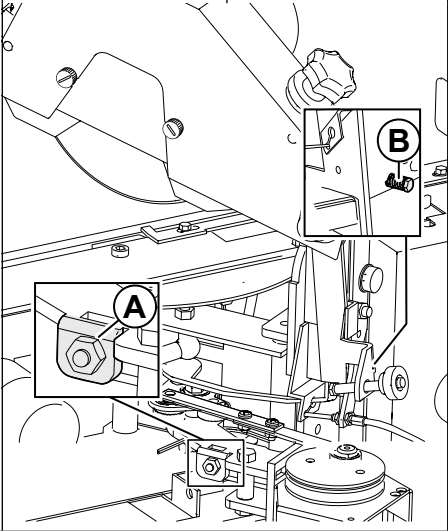
1. Insert a test chain into the machine and sharpen it according to the instructions in section 5, "Operation".
2. Test the functions of the machine and study its motions.
3. Make sure that:
 - the right (outer) and left (inner) cutters are sharpened to even lengths. Use a slide-gauge to measure. If they are uneven, see section 5.2.11, "Set the grinding length".
 - the grinding depth on the chain is deep enough. If the grinding wheel is worn, it needs to be adjusted, see section 5.2.10, "Center the grinding disc". If it needs to be changed, see section 6.3, "Change the grinding wheel and fit the grinding wheel guard".
4. Repeat the sharpening test until you see satisfactory test results, and the machine is running trouble-free.
5. Remove the test chain.

7.3 Issues

Issues	Possible cause	Corrective procedure
The depth of the gullets on the left and right cutters are unevenly sharpened.	The grinding wheel is not centered between the cutters.	See section 5.2.10, "Center the grinding disc".
The lengths of the right and left cutters are not the same.	The equal cutting teeth knob is incorrectly set.	See section 5.2.9, "Set the cutter top plate to equal lengths".
One of the troubleshooting indicator LEDs on the control panel is lit up.	There is an issue with one of the motors. An alarm is triggered and must be corrected.	See section 7.4, "Troubleshooting indicators".
The chain is not fixed during sharpening.	The chain vise is loose.	See section 6.5, "Adjust the chain lock".
	The air pressure is too low.	Check and adjust the air pressure.
The wrong cutter is sharpened.	The sensor is not correctly centered.	Center the sensor. See section 5.2.7, "Set the sensor".
The top-plate angles are not the same (e.g. 35° in one direction and 25° in the other) when the grinding head turns in the 2 different directions.	The M6 nuts needs to be adjusted.	See section 5.2.3, "Set the top-plate angle".
The grinding head "falls" without slowing down before it touches the cutter.	The wire is worn and needs to be adjusted.	See section 6.6, "Check and adjust the wire".
An incorrect number of cutting links are sharpened (too many or too few).	An incorrect number of cutting links was set on the counter.	See section 3.6.1, "Counter".
	The counter was not reset before the machine was operated.	See section 3.6.1, "Counter".
The cutters are not correctly sharpened.	Incorrect settings are used.	See section 5.2, "Prepare for operation".
The top-plate angle is too aggressive.	The top-plate angle setting is incorrect.	See section 5.2.3, "Set the top-plate angle".
The metal of a cutter turns blue during grinding, which is an indication of damaged or weakened metal.	The grinding speed is set too high and the metal is overheated.	Replace the damaged cutter or discard the chain. Lower the speed on the grinding speed knob, see section 3.6.2, "Grinding speed knob".
The sensor does not function and the error indicator LED lights up.	The fingers in the sensor are stuck.	Carefully clean the fingers with compressed air to loosen them. They should run smoothly in and out of the sensor. The indicator LED should turn off when the finger is pushed in and light up when the finger is released.
The machine stops and the error indicator LED lights up.	The chain has double tie straps or a cutter is broken.	See section 5.3.1, "Problems during grinding".

7.4 Troubleshooting indicators

Pos	Description	Possible cause	Corrective action
	The turning motor pulse indicator displays a flashing red light.	Shows that the gear shifts.	This is not an error indication. The turning motor pulse indicator is purely informative.
	The turning motor indicator shows a red light.	Shows that the turning motor or gear is broken, malfunctioning or that the power to the turning motor is broken.	Contact your regional sales representative to reach your service team.
	The chain pusher motor indicator shows a red light and the chain pusher motor is slow or has stopped.	The chain pusher motor or gear is broken.	Contact your regional sales representative to reach your service team.
		One or more drive links are broken.	Check for, and replace all damaged drive links, or discard the chain.
	The 3in1 motor indicator shows a red light.	Nut A (see below illustration) that is fitted on screw B (found on the opposite side of the grinding head)	Loosen nut A until the indicator light goes off.



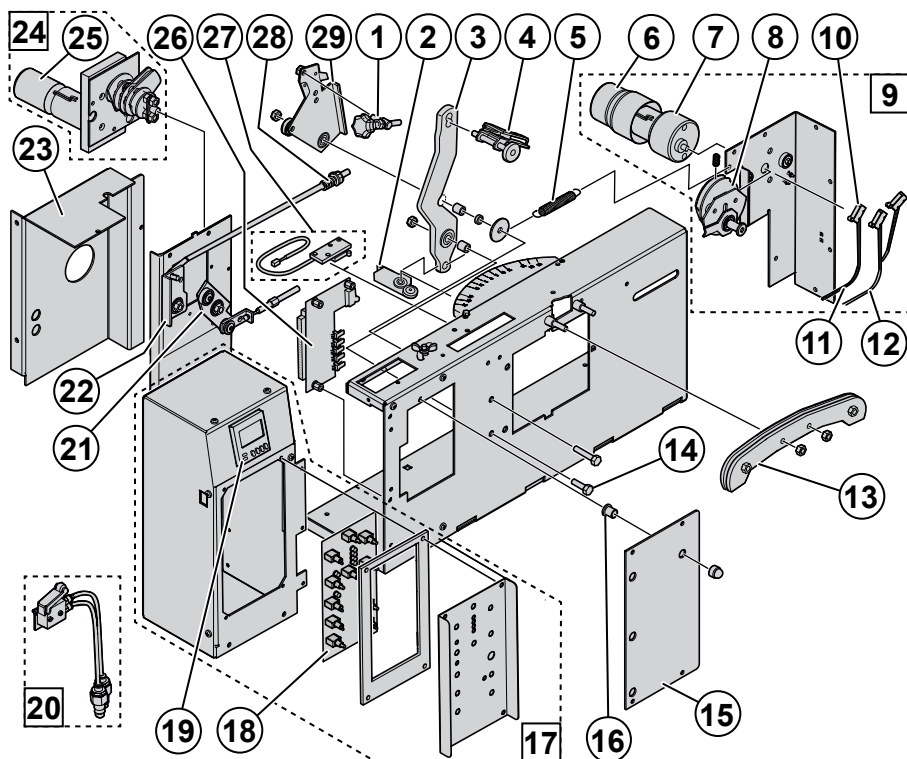
8 Accessories and Spare Parts

8.1 Ordering information

Contact your regional sales representative to order spare parts or accessories. Contact information to the manufacturer is located on the back cover of this user manual.

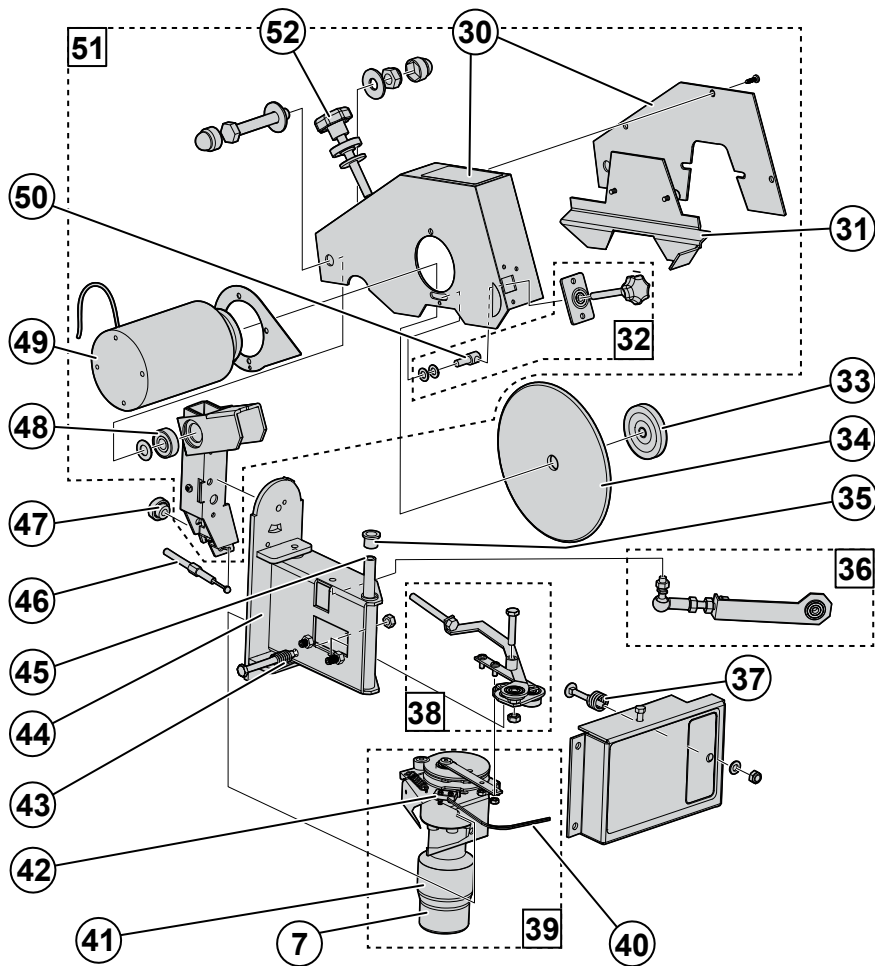
8.2 List of accessories

Included accessory	Description	Order Number
Exhaust pipe	Metal nozzle with hose attached to the grinding head. Connect to vacuum cleaner (not included).	808
Air cooling kit	Cools the chain during sharpening, to protect the metal in the cutting teeth from losing their strength. An air cooler allows sharpening at higher speeds. The air cooler uses compressed air to cool the chain.	14-700
Lamp	Magnetic lamp that can be attached to the machine.	14-701 (230 V) 14-702 (115 V)
Profile stone	Stone for profiling ceramic grinding wheels.	12-023
Profile template	Template show how to profile the grinding wheel for different chain types.	12-024
Optional accessory	Description	Order Number
Cleaning stone for CBN wheels	Use this cleaning stone to remove dirt and residues from the CBN wheel.	108
Telescopic chain extension kit	For extra long (.404 & 3/4") harvester chains, our telescopic extension is an ideal choice. It accommodates up to 4.5 m (14.5 ft) chain loops.	14-600C
Chain weight	Used to tension chain when machine is not mounted on the stand with air tensioner.	760 (1.5 kg chain weight) 860 (2 kg chain weight)
Grinding wheel	Dimensions (OD x W x ID)	Order Number
Ceramic grinding wheel	150 mm x 3.2 mm x 16 mm (5 7/8" x 1/8" 5/8")	780MPG
	150 mm x 4.8 mm x 16 mm (5 7/8" x 3/16" 5/8")	781MPG
	150 mm x 6.4 mm x 16 mm (5 7/8" x 1/4" 5/8")	782MPG
	150 mm x 7.9 mm x 16 mm (5 7/8" x 5/16" 5/8")	783MPG
	150 mm x 9.5 mm 16 mm (5 7/8" x 3/8" 5/8")	784MPG
CBN grinding wheel	145 x 4,8 x 16 mm (5 3/4" x 3/16" x 5/8")	102B
	145 x 3,2 x 16 mm (5 3/4" x 1/16" x 5/8")	103B



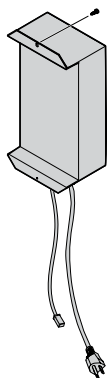
Pos	Spare Part	Order No.
1	Adjuster complete	12-047
2	Chain lock	12-107
3	Holder	18-114B
4	Chain pusher with sensor (see separate figure in section 8.5, "Sensor")	18-500
5	Tension spring	12-043
6	Motor cover	12-025
7	Turning motor	12-026
8	Cam curve assembly	18-129
9	Turning motor assembly	18-120
10	Micro switch	12-029
11	Wiring harness	13-102
12	Wiring harness, double	18-103
13	Chain vise complete	13-103B
14	Bolt M6 x 30	12-034

Pos	Spare Part	Order No.
15	Cover plate	
16	PDE bearing	12-032
17	Control unit assembly	18-230
18	Control board (PCB)	18-200
19	Counter	13-1100
20	Pneumatic valve assembly	13-605
21	Wire lifter assembly	13-108
22	Lock axis	12-037
23	Motor housing	18-050
24	Chain pusher motor assembly	18-111
25	Motor cover	13-131
26	Connector board	18-400
27	Stop switch assembly	18-102B
28	Compression spring	13-112
29	Chain pusher skip tooth assembly	18-111



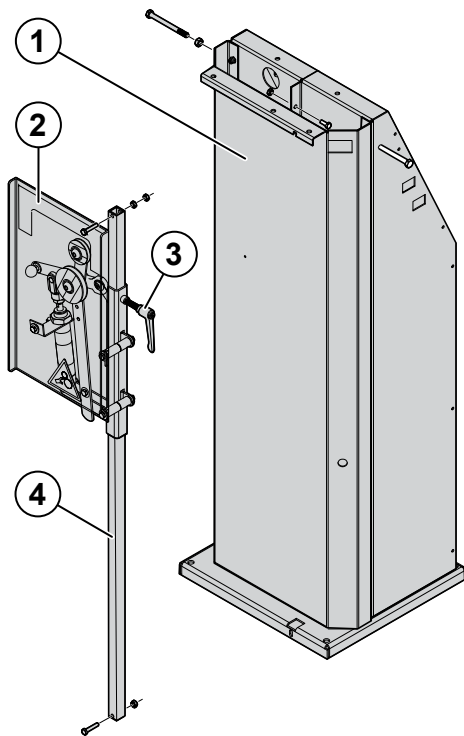
Pos	Spare Part	Order No.
30	Grinding head cover	18-116M
31	Grinding wheel guard	18-058M
32	Grinding wheel centering knob	13-117
33	Grinding wheel nut	13-118
34	Grinding wheel, see section 8.2, "List of accessories" for ordering information	
35	PDE bearing	12-062
36	Turning arm assembly	13-119
37	Center spring	12-061
38	Lifting arm assembly	13-125
39	Depth gauge motor assembly	18-122
40	Wiring harness	13-130
41	Depth gauge motor	13-123B
42	Micro switch	13-124
43	Compression spring	13-112
44	Degree beam	17-121
45	Axis	13-120
46	Wire	12-066
47	Plastic nut	13-127
48	Ball bearing 6000-2RS	12-065
49	Grinding motor	16-057D
50	Adjusting nut	13-128
51	Grinding head assembly	18-115M
52	Adjuster assembly	12-056

8.3 Converter



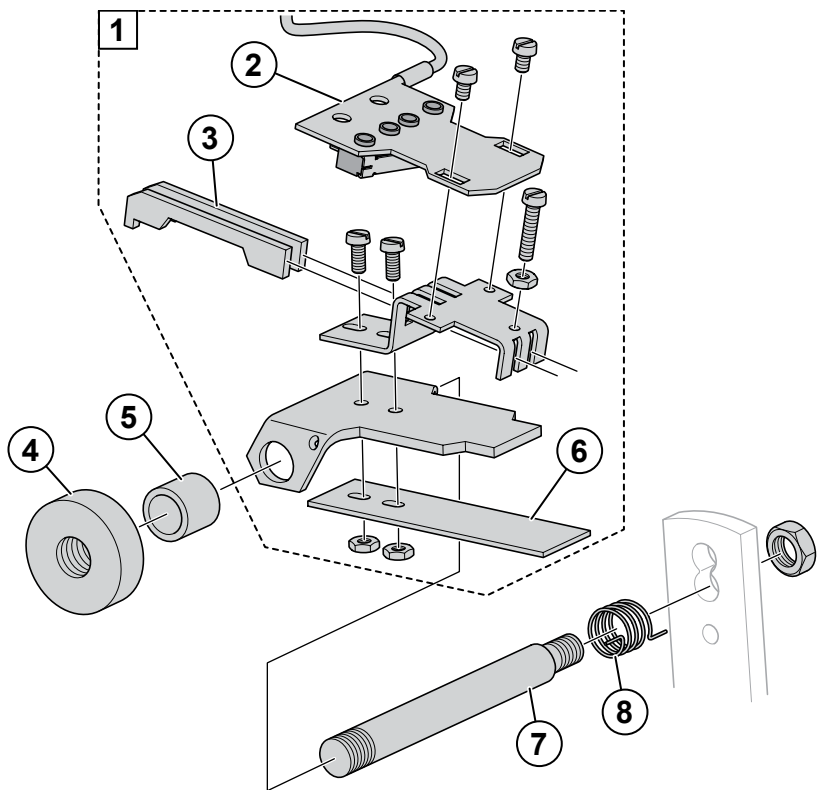
Spare Part	Order No.
Converter 115 V	805B
Converter 230 V	802B

8.4 Stand



Pos	Spare Part	Order No.
1	Stand	14-501
2	Pneumatic chain tensioner	14-507
3	Locking handle	14-601
4	Chain tensioner rod	15-506B

8.5 Sensor



Pos	Spare Part	Order No.
1	Sensor & chain pusher assembly	18-500
2	Switch plate	18-101
3	Sensor fingers	18-515
4	Plastic knob	18-513

Pos	Spare Part	Order No.
5	Washer	18-512
6	Hardened metal plate	18-514
7	Axis \varnothing 8 mm	18-511
8	Spring	18-510

9 Declaration of conformity



EC DECLARATION OF CONFORMITY

Markusson Professional Grinders AB
Tegelbruksvägen 3
762 31 Rimbo
Sweden

Certifies that the construction and manufacturing of the product Sensomatic conforms to the following directives, regulations and standards:

Directive/standard	Description
2006/42/EC	The Machinery Directive (MD)
2014/35/EU	The Low-Voltage Directive (LVD)
2014/30/EU	The Electro Magnetic Compatibility Directive (EMC)
EN-ISO 12100:2010	Safety of machinery - Basic components, general principles for design
EN 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 61000-6-3:2007	Emission standard for residential, commercial and light-industrial environments
EN 55014-1:2017	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
EN 55014-2:2015	- Part 2: Immunity

Responsible for technical documentation: Pär Markusson

Rimbo 2019/02/01


Oscar Löwenhielm
CEO



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